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ABSTRACT

The fifth in a series, this report reviews Apple microcomputer courseware--and some IBM computer courseware--authorized by Alberta Education from June 1985 to March 1986. It provides detailed evaluations of 97 authorized programs in business education (11), business education/math (1), computer literacy (4), computer literacy/math/problem solving (1), language arts (9), mathematics (41), math/problem solving (2), problem solving skills (3), and science (25). Several of the programs are in French. Each evaluation includes the disk title, producer(s), address, telephone number, grade level, contents, topics, additional hardware-software requirements, other formats available (not evaluated), year produced, cost, subject, and format. Also included are objectives, content description, content evaluation, instructional format description and evaluation, technical system description and evaluation, implementational support description and evaluation, a summary statement, status (basic, recommended or supplementary), and purchase information. (DJR)

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Computer Courseware Evaluations

June 1985 to March 1986

Curriculum

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Alberta
EDUCATION

COMPUTER COURSEWARE EVALUATIONS

June 1985 to March 1986

Clearinghouse
Curriculum Branch
Program Development Division
Alberta Education

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Inquiries about this report should be directed to the Manager, Clearinghouse, Alberta Education, 11160 Jasper Avenue, Edmonton, Alberta, Canada, T5K 0L2. (Telephone: (403) 427-2984.)

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ACKNOWLEDGEMENTS

Alberta Education acknowledges with appreciation the valuable contributions of the many teachers throughout Alberta who spent countless hours analyzing hundreds of computer software programs over the past twelve months.

Also, special thanks to project manager Wayne Blair, who developed the manual; Dave Wighton, compilation and editing; Keith Wagner, Jim Brackenbury and Garry Popowich for evaluation coordination; Learning Resource Officers Ardis Kamra, Mary Lyseng and Barbara Esdale; and, finally, to Dave Wighton, Marilyn Dyck, Mary Knox, Patricia Shields and Therese Pavone for their work on the synthesis reports.

INTRODUCTION

This publication is a service document containing evaluative information about computer courseware and is designed to guide and assist Alberta educators in the purchase of computer courseware. The materials in the guide do not constitute an exhaustive listing but, rather, they are the best computer courseware products the Clearinghouse could locate over the past twelve months, that support the Alberta curriculum.

Alberta Education uses a three-stage process for the evaluation of computer courseware products. Materials are first screened and, if found appropriate, the courseware is then evaluated independently by three teachers who have been trained and tested in evaluation techniques and in the use of an evaluation instrument developed by Alberta Education. Their three second-stage reports are synthesized and successful materials advance to the final stage. In that third stage, the courseware is assessed by Alberta Education's Program Development Division which makes a decision on its status. Three designations are used: basic, recommended and supplementary. These are defined as follows:

Basic Learning Resources are those learning resources approved by Alberta Education as the most appropriate for meeting the majority of the goals and objectives of courses, or substantial components of courses outlined in the provincial programs of studies.

AND

Those productivity software programs (e.g., word processors, spread sheets, data bases, integrated programs) approved by Alberta Education that can be used to achieve important objectives across two or more grade levels, subject areas, or programs.

Recommended Learning Resources are those learning resources approved by Alberta Education because they complement Basic learning resources by making an important contribution to the attainment of one or more of the major goals of courses outlined in the provincial programs of studies.

Supplementary Learning Resources are those learning resources approved by Alberta Education because they support courses outlined in the provincial programs of studies by enriching or reinforcing the learning experience.

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USING THE GUIDE

This publication is a listing of a large number of computer courseware evaluation reports. Each evaluation report is entered alphabetically, by title. A subject and title index are provided for convenient access to each report.

As indicated on the previous page, Alberta Education authorizes learning resources at a **Basic, Recommended** or **Supplementary** level. It is important for readers, particularly those outside of Alberta, to note that a major factor in the differentiation between these three levels is the amount of the Alberta curriculum that a product covers: one product may have a 'lower' status than another, but this may be due entirely to the relatively limited scope of the Alberta curriculum it supports.

Readers should also note that the designations used by Alberta Education are not equivalent to numerical scales or to summary phrases commonly in use by other evaluation agencies. Developers of this guide have deliberately avoided summarizing products with a single phrase or a numerical total as readers may place undue emphasis on such entries which, by their nature, are incomplete and potentially misleading. The courseware products described in this publication have varying strengths and weaknesses; they have different objectives and different pedagogical strategies designed to achieve these objectives. To gain full appreciation of the quality of the contents, the full report must be read.

This publication is the fifth issued by the Clearinghouse; earlier Clearinghouse publications were cumulative. For example, the last Clearinghouse publication on computer courseware evaluations contained all the reports from January 1983 to May 1985. This edition contains only new, or revised, reports; the May 1985 issue should therefore be retained as a useful guide.

ACQUIRING THE PRODUCTS

Sources for the products listed in this document are given at the end of each evaluation report. The following information is provided to clarify Alberta Education's present role in such acquisitions.

Products identified as **Basic** or **Recommended** learning resources are acquired and provided at discount prices through the Learning Resources Distributing Centre, formerly the School Book Branch. This is a branch of Alberta Education and discount prices are available to Alberta schools only. The Learning Resources Distributing Centre issues an annual catalog of products, and schools should order materials using the required forms.

The Learning Resources Distributing Centre also handles warranties and returns for microcomputer products. Please note that principals/purchasing officers are required to certify that the microcomputer products being purchased are for use by the school, and the products' copyrights will be protected.

The majority of authorized microcomputer products fall within the category of **Supplementary** learning resources. Schools can purchase such products through the Learning Resources Distributing Centre's special order process (please refer to the L.R.D.C. Buyer's Guide for special ordering procedures).

TO ORDER THE "COMPUTER COURSEWARE EVALUATIONS CATALOGUE"

Limited copies of this report are provided without charge to educational institutions within Alberta. Schools wishing additional reports or educators from outside of the province wishing to acquire the report may purchase copies from the Learning Resources Distributing Centre (formerly the School Book Branch):

Learning Resources Distributing Centre
Alberta Education
10410 - 121 Street
Edmonton, Alberta, Canada
T5N 1L2
Phone: (403) 427-2767

PLEASE NOTE: ALL ORDERS MUST BE ACCOMPANIED BY CHEQUE OR MONEY ORDER FOR $10.00 MADE PAYABLE TO THE LEARNING RESOURCES DISTRIBUTING CENTRE IN CANADIAN FUNDS.

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Evaluation Reports

ADDING FRACTIONS

DESCRIPTION

Disk Title: Adding Fractions
Author: Don Ross
Publisher: Microcomputer Workshops
Source: c/o CBS Interactive Learning, One Fawcett Place, Greenwich, CT 06836
Subject: Mathematics
Topics: Addition of fractions, least common denominator
Components: 1 disk, backup, guide (4p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monochrome monitor
IBM PC Family, 64K, monochrome monitor
Other Formats Available (not evaluated): Commodore Pet, TRS 80, Atari

Version: 1984
Display Language: English
Cost: $29.95 U.S. (1985)
Tel. #: (203) 622-2500
Users : Grades 7 - 8

OBJECTIVES

This program is designed to give students practice in adding fractions with unequal denominators and to facilitate the understanding of the least common denominator and the different processes used to find it.

PEDAGOGICAL CONTENT DESCRIPTION

In this drill and practice program students are given practice adding fractions. The program begins with an optional four page description of user procedures. It then randomly generates questions dealing with adding two fractions, some with common denominators, most without. The user determines how many questions are to be posed.

Each problem is displayed vertically on the top of the screen, a working area is provided, and a menu is depicted from which students choose the order in which the problem is to be solved (determine the lowest common denominator, add or reduce). The user then modifies the question if the correct option was chosen and proceeds to select another option until the correct reduced answer is determined.

PEDAGOGICAL CONTENT EVALUATION

The content range is appropriate for the intents of the program; however, the explanation at the beginning is not designed for original instruction. In fact, the beginning explanation is somewhat long and only provides directions on how proceed through the various solutions steps in the program; explanations on concepts behind those procedures are not given. The student can complete this section merely by following instructions to enter specific keys - no thinking is required.

The randomized presentation of questions provides ample depth. While there is no overall sequencing from easy to difficult, within each question students must choose from a menu the steps to be taken in the completion of a problem, thus ensuring that they follow a specific sequence of procedures for problem solving. As such, the program is best used for remediation; however, as there is no easy to hard sequence nor are difficulty levels available, the user will require prerequisital knowledge on adding fractions with common denominators, finding LCD's, reducing and converting improper fractions to mixed fractions before attempting this program.

INSTRUCTIONAL FORMAT DESCRIPTION

Users interact with the program by entering their name, selecting the appropriate procedure and entering numerical responses, e.g. determining the LCD, adding the numerators, etc.

The user determines how many questions (randomized) to receive. Correct answers result in the next step of the problem being presented until the final correct answer is determined. Errors in the selection of the process result in feedback statements. Two errors in determining the LCD result in the program branching to a section that shows how to find the LCD by two different methods - using multiples of the denominators or by prime factors. If the user makes two incorrect answers in adding, the correct sum is shown and (s)he is required to enter it.

At the end of each question, quantitative feedback gives the number of errors in the use of a rule, in computation and in determining the LCD. At the end of the drill, the total number of these errors is also shown.

INSTRUCTIONAL FORMAT EVALUATION

Student interaction is consistent and appropriate for the target audience. Apart from the introduction where the user is a passive reader/key pusher, the student is required to make frequent decisions and to enter responses that demonstrate understanding of the concepts involved. The fact that students control both the number of questions and the rate of program presentation is a program plus.

Common errors are anticipated and corrective, non-threatening feedback is provided. It should be noted that this will be sufficient to remind students of the correct procedures but will not suffice as original instruction. The quantitative error analysis provided at the end of each question set is useful for both teacher and student alike.

The presentation of the algorithm is sound. Users identify an LCD, convert the two fractions to the LCD, add the numerators and reduce. However, users are locked into the algorithm and have no opportunity to skip steps or move at a faster rate. This can make the program boring for students familiar with the process.

TECHNICAL CHARACTERISTICS DESCRIPTION

A split screen format is used on all questions: the top half of the screen displays the progression of the solution of the question while the bottom half of the screen is used as a workspace. Highlighted areas and flashing cursors are used to guide the user through the steps in the solution. Color and sound are not employed.

TECHNICAL CHARACTERISTICS EVALUATION

This program uses appropriate character size and make good use of highlighting and flashing to prompt the user for input. Transition between frames is quick and smooth.

The division of the screen into a work area and a message area is good. However, the screen format does not lend itself to clarity in answering the questions. The two fractions are shown underneath each other and changes to the question then proceed horizontally. This makes the conversion to equivalent fractions easy to see but the overall progression of the question can be confusing. This is complicated somewhat by the continual changing of the student's focus of attention from the question solution on the top of the screen and the step by step solution steps on the bottom.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

The four page teacher's guide outlines the program's objectives and provides a description of the program contents. The disk includes an optional management system with a capacity of six classes (35 students each) and provides five types of information: student name, student rank, student profile, class profile, and grade plot. Access to the management system is secured via a password.

IMPLEMENTATIONAL SUPPORT EVALUATION

The teacher's guide is clearly and succinctly written. The management system is excellent--it compiles a variety of data, it is easy to use, and it can produce screen or hard copy printouts.

SUMMATION

This disk uses the computer's abilities to provide step-by-step guided instruction in the problem solving process of adding fractions. The strengths of the program are its structured presentation, its good error trapping and the level of student interaction that is required. In addition, the management system is very comprehensive and provides data in various forms of ranking, in graphic form, and in a choice of soft or hard copy. However, the narrow range of the content, the lack of sequence from easy to difficult and the structured progression through the algorithm limits the program somewhat. It would be most appropriate for remediation where the student has had some introduction to the concepts and needs the structured assistance this program can deliver.

APPLE - IBM VERSIONS

This report has been based on an evaluation of the Apple version. In reviewing the IBM version, four significant differences were found:

1. The IBM version does not offer a data management system.
2. The IBM version allows only 10 letters for name input as opposed to Apple's 15.
3. The IBM version offers a sample problem before commencing the evaluated problems, a feature not found on the Apple version.
4. The IBM version allows the user a choice of 1 - 9 problems; the Apple version allows an unlimited number of problems.

Teachers should note that DOS 3.0 does not transfer directly to the IBM disk; it must be booted each time the program is run.

STATUS

The Apple and IBM versions of "Adding Fractions" have been designated as **SUPPLEMENTARY** learning resources for Mathematics Grades 7 to 8.

PURCHASE INFORMATION

This product may be purchased for $29.95 U.S. (1985) from CBS Interactive Learning at the address given at the beginning of the report. Lab packs are available in the following quantities and prices: 10 copies @ 3 x list price; 15 copies @ 4 x list price; 20 copies @ 5 x list price; 25 copies @ 6 x list price. The company provides a life time guarantee against defective diskettes and will replace worn out diskettes without charge at any time.

This diskette has the advantage of being capable of operation with more than one machine at a time; however, such use is subject to copyright laws and any license or purchase agreement.

ALGEBRA DRILL & PRACTICE I

DESCRIPTION

Title: Algebra Drill & Practice I
Authors: R. Detmer & C. Smullen
Publisher: Conduit
Source: University of Iowa, Oakdale Campus, Iowa City, IA 52242
Subject: Mathematics
Topics: Fractions, percents, integers, word problems, simplification, slopes and equations of lines
Components: 2 disks, backups, teacher's guide (39p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monochrome monitor
Other Formats Available (not evaluated): Available in Apple format only

Version: 1981
Display Language: English
Cost: $125.00 US (1986)
Tel. #: (319) 353-5789
Users : Grades 9 - 12

OBJECTIVES

The student should be able to:

1. Add, subtract, multiply, divide and reduce algebraic and numeric fractions.
2. Perform addition, subtraction, multiplication and division of one and two digit integers and apply the rules of order of operations to signed numbers.
3. Simplify first degree algebraic expressions using the distributive property and the collection of like terms.
4. Solve problems dealing with:
   a) Distance (using d = rt with two body motion)
   b) Perimeter of rectangles (given perimeter and the relationship between length and width)
   c) Dilutions (mixing solutions given concentrations and volumes)
5. Find the slope of a line given:
   a) two points on the line
   b) given its equations (Ax + By + C = 0)
6. Find the equation Ax + By + C = 0 given:
   a) its slope and a point on the line
   b) two points on the line
7. Find a percent of a given number, find what percent one number is of another, determine what percentage a change of price is and determine a new price after a percent change.

PEDAGOGICAL CONTENT DESCRIPTION

Each of the nine programs included in this package is intended to provide a supplementary teaching aid for a specific topic in elementary algebra.

ALGEBRAIC FRACTIONS - provides drill and practice with addition, subtraction, multiplication, division and reduction of algebraic fractions.

NUMERIC FRACTIONS - provides drill and practice with addition, subtraction, multiplication, division, and reduction of numeric fractions.

SLOPES & EQUATIONS OF LINES - presents four types of problems involving slopes or equations of lines:

1. The slope of the line through points such as (-2,4) and (3,-5)
2. The slope of the line with an equation such as 6x + 4y - 8 = 0
3. The equation of the line given the point and slope, e.g. (2,-4) and m = 3/2
4. The equation of the line through the two points such as (3,-2) and (-3,5)

PERCENTAGES - presents the following four sample types of problems involving percentages:

1. 15% of 120 = ?
2. 80 is what percent of 200?
3. The price of an item is $8. If the price is increased to $10.40, what is the percent of increase?
4. The price of an item is $16. If the price is decreased by 12%, what is the new price?

SIGNED NUMBERS - covers eight types of problems involving signed numbers and order of arithmetic operation in the format of: 3 + (-4) = ?, 2 - 3(-5) = ?, -2(-1 + 5) = ?, -2 + 6/2 = ?, -7(-8) = ?, -5(-2) - (-3)(6) = ?, 9/(-3) = ?, and (8 + 6) /(-2) = ?.

SIMPLIFYING EXPRESSIONS - provides drill and practice with simplifying algebraic expressions, including addition, subtraction, and use of the distributive property. Questions revolve around one of four problem types:

-3X +5X = ?, (2A - 3B) - (-A + 4B) = ?, -2 (-2S - 3T + 5) = ?, and 4 (X - 2Y + 3) - 3(X + 3Y - 2) = ?.

WORD PROBLEMS: DISTANCES - provides practice at four difficulty levels in setting up and solving word problems involving the formula "d = rt".

WORD PROBLEMS: RECTANGLES - provides drill in setting up and solving word problems involving lengths, widths, and perimeters of rectangles.

WORD PROBLEMS: MIXING SOLUTIONS - provides practice at four difficulty levels in setting up and solving word problems involving mixing solutions of different strengths.

All programs begin by presenting sample questions which can be again accessed if a question is answered incorrectly. Questions continue to be generated until the student has answered a certain number (ranges from 5 to 20) correctly on the first or second attempts. All answers are expected to be in proper mathematical form, although alternative forms are accepted if correct. For example, fractions are expected to be in lowest terms; however, unreduced answers are accepted.

PEDAGOGICAL CONTENT EVALUATION

The content of these disks is appropriate for the target audience. Content is clearly presented and the user has total control of sequence. Depth of presentation is sufficient to meet the program intents but it lacks variety in the types of solutions used. Unfortunately the distance program does not use metric measurements.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of menu selection, opting/bypassing examples by entering Y/N, paging through examples by hitting RETURN, and entering answers using the entire alphabetic, numeric and symbolic keyboard. Problems are randomly generated from a data bank. Students are given two attempts at each question. After one incorrect answer the message "That's wrong. Try again" is displayed. A second incorrect answer results in the message" That's still wrong" followed by a display of the solution worked out in detail as per the example.

INSTRUCTIONAL FORMAT EVALUATION

Student interaction is appropriate to the target audience. Random generation of questions provides good variety and allows the program to be used repeatedly; however, incorrectly answered questions unfortunately are not reposed later in the sequence. Feedback is immediate and non-threatening and effectively distinguishes between a wrong answer and the wrong format. The user has complete control of sequence, rate and amount. Messages presented throughout the drill sequence indicating that the student has reached the half way point or that only a few problems remain to be answered add motivation.

The absence of any form of pre-test or post-test is an instructional design weaknesses.

TECHNICAL CHARACTERISTICS DESCRIPTION

Color is used in information and feedback displays. A high resolution character set presents upper and lower case text in standard size.

TECHNICAL CHARACTERISTICS EVALUATION

Character size is appropriate, input methods are consistent, and displays are well formatted with smooth transition from one to another. The program uses excellent error handling routines. Although page turning is to be done via the RETURN key, pressing any key will advance the program to the next frame.

SUMMATION

Good content development, sound instructional design and excellent error handling combine to make "Algebra Drill and Practice I" a valuable supplement to classroom teaching. The program's chief drawbacks are the lack of metrication, the lack of an evaluation system, and the absence of a management system.

STATUS

"Algebra Drill and Practice I" has been authorized as a **SUPPLEMENTARY** learning resource for grades 9-12.

PURCHASE INFORMATION

This product may be purchased for $125.00 U.S. (1986) from Conduit at the address given at the beginning of the report. Additional copies for student workstations may be obtained by ordering the "Educator Pack" which sells for two times the price of the regular package and includes all materials in the base package plus four additional copies of the software. Additional manuals are not included but may be ordered separately ($5.95).

Defective diskettes will be replaced without charge within a 30 day warranty period. Thereafter, disks may be replaced for $10.00.

As part of the purchase agreement, the buyer agrees that a software disk will be used on only one machine at a time at a single site.

ALGEBRA DRILL & PRACTICE II

DESCRIPTION

Title: Algebra Drill & Practice II
Author(s): Richard Detmer & Clinton Smullen III
Publisher: CONDUIT
Source: University of Iowa, Oakdale Campus, Iowa City, IA 52242
Subjects: Mathematics
Topics: Solving linear equations, equations & inequalities, simplifying expressions
Components: 2 Disks, backups, teacher's guide (32p.), student's guide (26p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monitor
Other Formats Available (not evaluated): Available in Apple format only

Version: 1982
Display Language: English
Cost: $125.00 US (1986)
Tel. #: (319) 353-5789
Users: Grades 10-12

OBJECTIVES

This package is designed to provide drill and practice in a number of algebraic topics including absolute value, integral exponents, linear equations, linear systems with two and three variables, factoring binomials and trinomials, determining roots of quadratic equations, and calculating linear inequalities.

PEDAGOGICAL CONTENT DESCRIPTION

Each of the nine programs included in this two disk package is intended to provide drill and practice and thus serve as a supplemental teaching aid for a specific topic in elementary algebra:

DISK ONE:

ABSOLUTE VALUES - includes four problem types: the first covers only the definition of the absolute value of a number; the remaining three cover solving equations and inequalities involving absolute values.

INTEGRAL EXPONENTS - provides drill in simplifying expressions with integral components. Type 1 - 4 problems include positive exponents only; type 5 and 6 problems involve either positive or negative exponents; and type 7 problems always involve negative number exponents.

LINEAR EQUATIONS - offers practice in solving linear equations ranging from one step solutions to five step solutions using parentheses

LINEAR SYSTEMS IN TWO VARIABLES - poses problems in which linear equations with two variables must be solved. Type 1 problems can be solved by eliminating a variable through adding the equations; type 2 problems involve multiplying by a constant and adding the resulting equation to the remaining equation; and, type 3 problems necessitate that both equations be multiplied by a constant before adding the equations together. A graphical solution of the system is offered as an option at the end of the problem.

LINEAR SYSTEMS IN THREE VARIABLES - offers drill in solving linear equations with three variables. Type 1 problems have one zero coefficient; type 2 problems have no zero coefficients.

DISK TWO:

FACTORING BINOMIALS AND TRINOMIALS - involves factoring linear and quadratic expressions, both binomials and trinomials. Type 1 questions can be solved by factoring a positive or negative integer out of both terms, type 2 questions involved factoring a monomial out of both terms, and types 3 and 4 questions require the factoring of the product of two binomials.

ROOTS OF QUADRATIC EQUATIONS - provides drill in calculating the roots of quadratic equations and offers related facts about the graphs of parabolas. Type 1 questions ask students to identify the roots of a factored quadratic equation of the form "(x+2)(x-5) = 0"; type 2 questions involve factoring the equation and then determining the roots; and types 3 and 4 problems ask students to identify the coordinates of the vertex of a quadratic function.

LINEAR INEQUALITIES and MORE LINEAR EQUALITIES - offers drill in solving linear inequalities. Type 1 inequalities are in the form of "x - 13 < -9"; type 2 follow the format of "-4a >= 24", and type 3 is of the form "7x + 5 <= 26".

PEDAGOGICAL CONTENT EVALUATION

The content of these disks is appropriate for the target audience provided prior classroom instruction in the concepts has been given. The breakdown of each program into a number of problem types results in effective sequencing. Content is clearly presented, although in some cases insufficient range is evident. (E.g. throughout the programs, the value used for the constant tends to be small and thus results in an overly simplified problem; in "Solving Linear Equations" no practice is given in solving inequalities with rational expressions, etc.)

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of menu selection, opting/bypassing examples by entering Y/N, paging through examples by hitting RETURN, and entering answers using the entire alphabetic, numeric and symbolic keyboard. Problems are randomly generated from a data bank. Students are given two attempts at each question. After one incorrect answer the message "That's wrong. Try again" is displayed. A second incorrect answer results in the message" That's still wrong" followed by the answer together with an optional display of the solution worked out in detail as per the example.

INSTRUCTIONAL FORMAT EVALUATION

Student interaction is appropriate to the target audience. Random generation of questions provides good variety and allows the program to be used repeatedly; however, incorrectly answered questions unfortunately are not reposed later in the sequence. The program unfortunately does not use the computer's calculation abilities to enable a problem to be worked out on screen (i.e. paper and pencil calculations are required) or to provide intermediate solution feedback. Feedback is immediate and non-threatening and effectively distinguishes between a wrong answer and the wrong format. The user has complete control of sequence, rate and amount. Messages presented throughout the drill sequence indicating that the student has reached the half way point or that only a few problems remain to be answered add motivation.

The absence of any form of pre-test or post-test is an instructional design weaknesses.

TECHNICAL CHARACTERISTICS DESCRIPTION

Color is used in information and feedback displays. Combination upper and lower case text is presented in standard size, double spaced.

TECHNICAL CHARACTERISTICS EVALUATION

Character size is appropriate, input methods are consistent, and displays are well formatted with smooth transition from one to another. The program utilizes excellent error handling routines. Although the user is instructed to activate page returns via the RETURN key, pressing any key will advance the program to the next frame. Unfortunately there are no provisions for back-paging--this would be useful, particularly in sections where the instructions cover several frames.

SUMMATION

Good content development, sound instructional design and excellent error handling combine to make "Algebra Drill and Practice II" a valuable supplement to classroom teaching. The program's chief drawbacks are the lack of an evaluation system and the absence of a management system.

STATUS

"Algebra Drill and Practice II" has been authorized as a **SUPPLEMENTARY** learning resource for grades 10-12.

PURCHASE INFORMATION

This product may be purchased for $125.00 U.S. (1986) from Conduit at the address given at the beginning of the report. Additional copies for student workstations may be obtained by ordering the "Educator Pack" which sells for two times the price of the regular package and includes all materials in the base package plus four additional copies of the software. Additional manuals are not included but may be ordered separately ($2.75 each for teacher guide and student guide).

Defective diskettes will be replaced without charge within a 30 day warranty period. Thereafter, disks may be replaced for $10.00.

As part of the purchase agreement, the buyer agrees that a software disk will be used on only one machine at a time at a single site.

ALGEBRA WORD PROBLEMS VOLUME III

DESCRIPTION

Title: Algebra Word Problems Volume III: Mixture, Coin and Investment
Author(s): Doug Higgins, Neil Sambol & Mark Berman
Publisher: Microcomputer Workshops
Source: c/o CBS Interactive Learning, One Fawcett Place, Greenwich, CT 06836
Subject: Mathematics
Topics: Developing strategies in analyzing & solving coin, mixture & investment word problems
Components: 1 disk, backup, teacher's guide (13p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monochrome monitor
Other Formats Available (not evaluated): Available in Apple format only
Alberta Education Call No.: QA 157 A394 1984

Version: 1984
Display Language: English
Cost: $39.95 US (1985)
Tel. #: (203) 622-2500
Users: Grades 8 - 10

OBJECTIVES

This program is designed to give students practice in developing strategies in analyzing and solving coin, mixture and investment word problems.

PEDAGOGICAL CONTENT DESCRIPTION

This program provides the user with four options: coin problems, mixture problems, investment problems and general instructions. Each type of problem is divided into four stages: translating the verbal portion of the word problem into a mathematical expression that is entered into a chart, forming an equation using the information from the chart, solving the equation for an unknown and using the unknown to find the answer(s) to the word problem. The student is first taken step-by-step through a sample problem and then any number of similar problems are randomly generated for drill and practice. After each practice problem the student is provided with an error analysis of his/her solution and an explanation of what each error category means. The "General Instructions" provide the student with a step-by-step solution to a coin problem introducing the student to the method of entry for each question, keys that need to be used and an explanation of the error analysis and its options.

PEDAGOGICAL CONTENT EVALUATION

The sequence and depth are appropriate to most of the target audience and fit the Alberta curriculum, especially at the grade nine and ten level. The sequencing of presentations within a problem is good with incrementation being small enough for a student to grasp; however, there is no development from easy to difficult from one question to another. The range is narrow in that only three types of problems which require the same basic solution format are presented. Unlimited practice is provided by the randomly generated problems. The structured problem solving format which makes a student apply a logical approach in solving each question is a strength in this program.

The content is presented in a clear and readable format, but the vocabulary in the error category may require teacher explanations for some students. It would be beneficial to have the mixture questions metricated.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of name entry, menu selection, reading text, using the SPACE BAR and RETURN keys, inputting responses that involve operational symbols, brackets, directional signs, number and letter keys. The inputted data must be correct before advancement in the program is permitted.

The questions are randomly generated and are solved in a step-by-step manner. Textual feedback is provided after each step. A correct response results in a short congratulatory message. When a student makes errors, a clue is provided for up to two attempts and then the correct answer is provided. The clues may highlight parts of the wording of the problem or may be textual reminders of certain relationships. An error analysis is provided after each problem is completed to indicate the type of errors made and the total number of errors. No pre- or post-tests are provided.

INSTRUCTIONAL FORMAT EVALUATION

The interaction is easy, consistent and appropriate with the student being actively involved. The instructional technique using the step-by-step problem solving format is an effective learning device; however, it may become tedious for students who are proficient in solving this type of problem. Some students may be confused by the fact that the program will not accept "1x" for "x" or ".10 " for ".1" but this can readily be explained by the teacher.

The questions are appropriate and effectively randomized, but they are not sequenced from easy to difficult. The feedback is non-threatening, immediate and generally suitable. However, receiving an "excellent" or "fantastic" after being given the answer is questionable. The clues given with the negative feedback are helpful and directing a student's attention to facts in the problems by highlighting is effective. The error analysis is useful in that the student can see where (s)he made errors, but the description of the error category may be too technical for some students. It would be helpful to have a summary at the end of a practice session.

A pre-test to determine levels of student readiness and a post-test to evaluate student progress would be useful.

TECHNICAL CHARACTERISTICS DESCRIPTION

The letters and numbers are presented in standard size print using both lower and upper case letters. Inverse text is used for highlighting. No sound or color is used. Graphics are used in the chart or grid only.

TECHNICAL CHARACTERISTICS EVALUATION

The technical design is good with displays which are appropriate and easy to read. The inverse print used in highlighting is effective in attracting the user's attention. The screen is formatted effectively to allow sufficient room for student input. The program is easy to use and appears to be reliable under normal use. It can be used with only one computer at a time.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

No special entry competencies are stated. No management system or user support materials are provided. The teacher documentation includes the objectives, a program description, program sequence and sample problems with explanations.

IMPLEMENTATIONAL SUPPORT EVALUATION

Although the documentation does not identify any specific entry competencies, students should receive instruction in solving mixture problems prior to using the program. The lack of a management system is a disadvantage, but this is partly compensated by the error analysis being printable. The teacher documentation provides adequate information and is easy to follow. The program is easy to use and will require very little teacher supervision.

SUMMATION

The major strength of this program is in the instructional format which provides a clear and structured step-by-step approach to solving equations. Student interaction is good and the program is user friendly. The feedback provided in the program is generally appropriate with the assistance with the negative feedback being helpful.

It would be beneficial to have better sequencing by developing easy to hard questions. It is unfortunate that the program does not allow more flexibility in the solutions to problems which would allow some shortcuts for the more able students. The error analysis may be more useful if the descriptions used were not as technical and if a summary at the end of the drill period was provided.

STATUS

"Algebra Word Problems: Volume III" has been designated as a **SUPPLEMENTARY** learning resource for grades 8-10.

PURCHASE INFORMATION

This product may be purchased for $39.95 U.S. (1985) from CBS Interactive Learning at the address given at the beginning of the report. Lab packs are available in the following quantities and prices: 10 copies @ 3 x list price; 15 copies @ 4 x list price; 20 copies @ 5 x list price; 25 copies @ 6 x list price. The company provides a life time guarantee against defective diskettes and will replace worn out diskettes without charge at any time.

As disk interaction is frequent, use of this program is limited to one machine at a time.

APPLE PRESENTS APPLE

DESCRIPTION

Disk Title: Apple Presents Apple
Author(s) J.D. Eisenberg & Bruce Tognazzini
Publisher: Apple Computer Company
Source: 10260 Bandley Drive, Cupertino, California 95014
Subject: Computer Literacy
Topics: The functions of the Apple II keyboard
Components: 1 disk
System Requirements: Apple II model, 1 disk drive, monitor, game paddles (II+ only)
Other Formats Available (not evaluated): Available in Apple format only
Note: A different version of this product is available for each of the Apple II models.
Alberta Education Call No.: QA 76.8 .A6 A648 1981

Version: 1982
Display Language: English
Cost: None
Tel. #: (408) 996-1010
Users : Grades 4 - 10

OBJECTIVES

Learners will know how to use the Apple II keyboard to input responses and commands and will know how to correct typing errors.

CONTENT DESCRIPTION

The content of the program varies slightly according to the type of Apple computer it introduces. Generally, the program discusses the function of each microcomputer keyboard character, and includes a discussion of:

- the RETURN key as a page turning device and a means of entering information;
- the similarities between a typewriter and a microcomputer keyboard;
- the arrow keys as cursor movement controls;
- the differences between the numerical zero and the letter 'O' keys;
- the differences between the numerical '1' and the lower case letter 'l';
- the functions of the space bar;
- the operation of the shift, control, escape, and reset keys; and
- the use of CONTROL G to produce a bell tone.
- friendly vs. unfriendly computer programs.
- the BASIC commands of "catalog" and "run".

CONTENT EVALUATION

Content range is appropriate for a beginning user of an Apple II. The program is well sequenced in small, incremental steps, and the user must input a correct response before progression is allowed. Sufficient depth is available to achieve the intents of the program.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of depressing each function key as it is being introduced and of using the RETURN as a page turning device. Questions are presented in a preprogrammed sequence and immediate feedback is provided: correct responses receive a positive textual message; incorrect responses receive textual and pictorial hints (e.g. the correct key to be depressed will flash on the keyboard diagram).

INSTRUCTIONAL FORMAT EVALUATION

The overall instructional technique is very appropriate for the target audience. Students are introduced to the various key functions sequentially and are provided with sufficient interaction to assure motivation. The linearly sequenced questions are effective for first time users but would become boring for repeat users.

Feedback is non-threatening and immediate. Helpful prompts for incorrect responses are continually presented until the user inputs the correct reponse.

TECHNICAL DESIGN DESCRIPTION

This program uses high resolution graphics to depict a microcomputer keyboard. Sound is introduced in conjunction with the "beep" tone which is heard when CONTROL G is depressed. Standard size combination upper/lower case lettering is used.

TECHNICAL DESIGN EVALUATION

The high-resolution depiction of the keyboard combined with the use of inverse flashing letters to depict the key under consideration allow for an easy to follow presentation. Displays are clear and uncluttered. The program is very user-friendly.

SUMMARY STATEMENT

Logical presentation of function keys, excellent technical design, and sound instructional format combine to make this program an effective tool for teaching microcomputer keyboard functions to first time Apple II users.

STATUS

"Apple Presents Apple" has been authorized as a **SUPPLEMENTARY** learning resource for Computer Literacy, Grades 4-10.

PURCHASE INFORMATION

This product is not copy protected and is provided free of charge with each purchase of an Apple Computer. Due to frequent disk interaction, the program may be used with only one computer at a time.

APPLEWORKS

DESCRIPTION

Title: Appleworks
Author(s): Robert Lissner
Publisher: Apple Computer, Inc.
Source: 20525 Mariani Avenue, Cupertino, California 95014
Subjects: Business Education
Topics: Word Processing, Data Base Management, Financial Spreadsheet
Components: 3 disks (Apple Presents Appleworks, sample files, start-up/program disk), reference manual, tutorial
System Requirements: 64K (128K preferred), 1 disk drive (2 preferred), printer, 80 column card (for IIe only), monitor
Other Formats Available (not evaluated): Available only in Apple format.
Alberta Education Call No.: HF 5548.115 A648 1983

Version: 1983
Display Language: English
Cost: $339 (1986)
Tel. #: (408) 996-1010
Users: Grades 10 - 12

OBJECTIVES

Appleworks is an integrated software program designed to familiarize the student with the three most popular applications for personal computers--a word processor, a data base, and a spreadsheet--and to provide a means of sharing information between these three components.

WORD PROCESSING DESCRIPTION

The word processor is the dominant component of Appleworks. Document size is limited to about 8 pages on a 64K computer or 26 pages with a 128K computer. File names are restricted to 15 alphanumeric characters and must begin with a letter. A one inch default for left, right and top margins and a two inch bottom margin is built in, however margin settings can be changed and saved with each file created. Single, double, or triple line spacing, between-margin centering, and justification settings can be changed for each paragraph. Default tabulations are set at every 5 spaces.

Cursor movement can be accomplished via the arrow keys, or for larger "jumps", reference can be made to the Appleworks ruler which divides a document into eighths and allows quick movement via the open apple key followed by a number 1 - 9.

WORD PROCESSING EVALUATION

The word processor is efficient in operation. Default values for line spacing, tabulation, and margin settings can be easily altered. Centering within the word processor is limited to between margins only; however, centering over a column is possible in the spreadsheet and documents created there can subsequently be transferred to the word processor. Since justification can be accomplished by paragraphs, it is possible to print a report with some parts justified and others not at the discretion of the user. A problem occurs when right justification is invoked with enumerations as it causes misalignment. While word wrap cannot be disabled, "sticky" spaces can be used to keep short items (like the initials of a name) together.

The document length restriction of eight pages on a IIe is limiting, however this can be overcome by the fact that several files can be linked together. The screen display closely approximates the printed page, however justification, boldfacing, underlining, and special characters (e.g. subscripts), are embedded commands indicated only by a ^ on the screen. While half spacing cannot be accommodated, super and sub scripts can be handled via embedded print commands.

FINANCIAL SPREADSHEET DESCRIPTION

The Appleworks spreadsheet offers 127 columns and 999 rows and provides the mathematical functions of average, count, look-up, maximum, minimum, net present value, square root, and sum in conjunction with conditionals of IF/THEN. Variable column widths are allowed with the smallest column being 3 characters wide. If formulas are entered which are longer than the assigned column width, only that portion which fits the width will be displayed, however the entire formula can be viewed via "Open Apple Z". The spreadsheet makes provision for decimal rounding and use of leading dollar signs, however scientific notation is not accommodated. Negative numbers are indicated by enclosure in parentheses. Moves of 125 columns or 250 rows at one time can be accommodated and are assisted by split screen viewing featuring either synchronized or independent scrolling.

FINANCIAL SPREADSHEET EVALUATION

The 126,873 cells available for data entry in Applework's spreadsheet are theoretically ample, in fact, the memory runs out long before the capacity is full. Depending upon the complexity of the formula, a 64K computer will allow approximately 1000 filled cells; a 128K computer will allow approximately 6000 filled cells. The nine mathematical calculation functions offered by Appleworks are much less than those offered by stand alone spreadsheets, however the arithmetic operators are adequate to illustrate the use of spreadsheets for accounting and budgeting in an educational setting. Excellent integration between the spreadsheet and the data base and the word processor is offered.

DATA BASE DESCRIPTION

Applework's data volume capacity is defined as 1350 records containing 30 fields with a maximum entry size of 76 characters. Field names are definable by the user and the program will support a variety of field types (numerical, alphanumeric, integer, floating point, etc.) The program will perform a sort on any field and it offers a variety of selection criteria (equal, >, <, range, not, or, etc.) including partial fields. It can search for more than one field at a time and will search for strings as well as words.

DATA BASE EVALUATION

Applework's data base manager offers sufficient power to provide a good introduction to data management; however, it lacks sufficient text capacity to enable use for applications such as multiple choice test construction. The theoretical data volume capacity is again practically limited by memory constraints--approximately 140 records on an 64K computer and 750 records on a 128K machine. The creation of templates is relatively easy and the available search and sort functions are adequate. Based upon a test evaluation of 100 records with seven fields/record, the sorting speed is very satisfactory. The fact that searches and sorts can be viewed on screen prior to printing is a program plus. While changes to a data base are possible after initial template creation, adding or deleting fields destroys the layout and report formats, however the records themselves remain intact. (Users may be advised to provide some unused categories during initial template construction, thus overcoming this problem should new fields need to be added.) Reports can be easily saved for subsequent recall or for transfer to another part of the integrated package. The allowance of 19 characters for a report name or 76 characters for a report title is ample for most applications.

INTEGRATION DESCRIPTION

Text to be moved, copied, or deleted is highlighted with inverse lettering, moved to the clipboard, and from there moved to the receiving document. Beeps draw attention to errors. A "find" command (in forward search motion only) is available in all three components; "find and replace" is available only in the word processor, however.

The flexibility of the print options depends largely upon the type of printer used. True screen formatting (with the exception of embedded commands) is available if the hardcopy is being printed in 10 characters per inch, however a compressed print mode of 17 characters per inch is available. The program offers six lettering sizes and italics print can be added. Horizontal lines are accommodated; vertical lines appear in broken mode. The program makes no provision for spooling or for priority printing.

INTEGRATION EVALUATION

Appleworks offers a high degree of integration between its three components. The "desktop" allows for 12 files to be contained in RAM--entire files or parts of files can be moved between components via the clipboard. All files in the spreadsheet and data manager can be moved to the word processor for refined editing, however moves from the spreadsheet to the data manager sometimes require that DIF or ASCII files be created. Insertions and deletions are *easily accommodated. The inverse highlighting together with a confirmation question* help to reduce potential errors. Error messages clearly identify hardware errors (e.g. wrong disk in drive), however operational error messages would likely need to be referenced in the manual. The use of a common command structure effectively shortens learning time.

Unfortunately the program does not offer any form of password security and it offers only limited file locking ability.

The print options work as described, however some initial problems may be encountered when configuring the program to one's individual printer. (The program is designed specifically to run with Apple's own serial printer, the "Imagewriter"; gaining interface with parallel printers will require some experimentation). Excellent page numbering options are available. The lack of spooling options and the lack of provision for priority printing are limiting factors.

Although Appleworks will integrate with certain external packages (e.g. Access II, a communications package and MegaWorks, a mail merge and spelling checker program) such files cannot be retained as a desk-top files, thus a separate disk boot is necessary.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

Appleworks supplies two demonstration disks and a tutorial disk. A reference manual and a tutorial manual are included, both of which contain diagrams, examples, tables of contents, indices, etc. A quick reference card summarizes all commands.

IMPLEMENTATIONAL SUPPORT EVALUATION

The Appleworks documentation is comprehensive, well-organized, and sequentially developed. Excellent use is made of pictures and illustrations which conform to screen layout. The tutorial disk provides a nice step-by-step introduction to integration and includes optional self-tests. The word processing and the electronic spreadsheet modules are clearly explained both on disk and in the documentation, however users will likely find a need to experiment with the specific applications of the data based manager.

The program is reliable and bombproof in normal classroom use.

SUMMATION

This program offers good integration if used with 128K memory--Apple IIe owners are strongly urged to upgrade to 128K in order to gain full utility from the program. The ability to work with up to twelve files at once provides a nice overview of integration in the high school business setting. Good documentation, the inclusion of a tutorial disk, and the use of a common command structure facilitate learning.

In summary, although Appleworks lacks the report generation abilities and sophisticated features of many stand-alone programs, it is a very functional, easy to learn, well-documented program which is ideally suited for "first-time" and personal users. While it would be an excellent program to use when introducing students to the concept of integration, the individual modules in themselves do not offer sufficient functions and power to adequately prepare students for business job entry.

STATUS

"Appleworks" has been authorized as a BASIC learning resource for Computer Processing 10/20/30.

PURCHASE INFORMATION

Alberta schools may purchase this product from the School Book Branch at a 40% discount. As of the printing date, a price had not been determined. However, schools can anticipate a final price that is substantially less than the price shown at the beginning of this report. Contact the School Book Branch or see their catalog for details of the actual price.

APPLEWORKS

DESCRIPTION

Titre: AppleWorks
Auteur(s): Rupert Lissner
Éditeur: Apple Computer, Inc.
Source: 20525 Mariani Avenue, Cupertino, California 95014
Matière: Sciences commerciales
Sujets: Traitement de texte, Gestion de base de données, Tableur
Composantes: 2 disquettes (démarrage/programme, fichiers exemples), manuel de référence, manuel de travaux pratiques, 1 carte de référence
Matériel requis: Apple IIe/IIc (128K), clavier français, 1 unité de disque (2 facultatives), imprimante, carte texte 80 colonnes ou 80 colonnes étendue (pour IIe), moniteur vidéo
Disponibilité sur d'autre ordinateurs (pas d'évaluation): Disponible sur format Apple seulement.

Version: 1983
Langue d'affichage: Français
Coût: 359,40 $ (1986)
Tél.: (408) 996-1010
Utilisateurs: Sec. 10-11-12

OBJECTIFS

AppleWorks est un logiciel intégré, conçu pour familiariser l'élève avec les trois applications les plus connues dans le monde des ordinateurs personnels: un programme de traitement de texte, de gestion de données et de tableur. Elle permet donc de combiner les trois types d'informations.

DESCRIPTION DU TRAITEMENT DE TEXTE

L'application de traitement de texte est la composante principale d'AppleWorks. La taille maximum d'un fichier pour un ordinateur muni d'une mémoire vive de 128K peut contenir environ 26 pages. Les noms de fichiers peuvent compter jusqu'à 15 caractères: des lettres, des nombres, des espaces et des points, mais ils doivent commencer par une lettre. Les marges proposées par défaut sont un pouce pour les marges du haut, de gauche et de droite et deux pouces pour la marge du bas. Les marges peuvent être modifiées par l'utilisateur et sauvegardées pour chaque fichier créé. Les valeurs: d'interligne - simple, double ou triple, de centrage entre les marges et de justification peuvent être programmées pour chaque paragraphe. Les tabulations sont définies initialement tous les 5 espaces.

Le curseur peut être déplacé en utilisant les flèches. Pour des sauts plus grands, l'élève utilise la règle d'AppleWorks qui divise le document en huit parties et permet le déplacement précipité en utilisant la pomme ouverte et un nombre de 1 à 9.

ÉVALUATION DU TRAITEMENT DE TEXTE

Le traitement de texte fonctionne efficacement. Les valeurs par défaut pour l'interligne, la tabulation et les marges peuvent facilement être changés. Dans le traitement de texte on ne peut centrer qu'entre les marges; cependant, avec le tableur, il est possible de centrer dans une colonne. Un document créé avec le tableur peut être transféré par la suite au traitement de texte. Etant donné que la justification peut être exécutée par paragraphe, il est possible d'imprimer un document avec des parties qui sont justifiées et d'autres qui ne le sont pas. Un problème se produit quand la justification de droite est demandée avec une énumération car on crée un alignement faux. Même si le cadrage du texte ne peut être immobilisé, il peut être contrôlé en utilisant des espaces durs pour garder ensemble deux mots courts.

La possibilité maximum de 26 pages pour un document sur un Apple IIe est restrictive. Toutefois, cela est surmontable par le fait que plusieurs fichiers peuvent être reliés ensemble. L'affichage visuel à l'écran présente de façon assez exacte la page imprimée. Cependant, la justification, les caractères gras, les soulignements et les caractères spéciaux (par ex.: indices inférieurs) sont des commandes intégrées et sont indiquées par " ' " sur l'écran. Les demi-espaces ne sont pas possibles mais des indices supérieurs et inférieurs sont acceptés par des commandes intégrées d'impression.

DESCRIPTION DU TABLEUR

Le tableur d'AppleWorks offre 127 colonnes et 999 lignes. Il accomplit les fonctions mathématiques de moyenne, de calcul, de "lookup" (de référence), de valeur maximale, de valeur minimale, de valeur actualisé nette, de racine carrée et de somme conjointement avec des opérateurs logiques. La largeur d'une colonne peut varier de 1 à 75 caractères. Quand une formule est entrée, seule la partie de la formule qui correspond à la largeur de la cellule sera affichée. Vous pouvez faire un "zoom avant" sur la formule de chaque cellule. Le tableur peut arrondir les décimales mais, il n'y a pas de disposition pour les notations scientifiques. Les nombres négatifs sont mis entre parenthèses. Des sauts de 125 colonnes ou de 250 lignes peuvent être accommodés et sont précipités en partageant le tableau en deux fenêtres qui se déplacent soit indépendamment l'une par rapport à l'autre, soit les deux parties simultanément.

ÉVALUATION DU TABLEUR

Les 126,873 cellules disponibles pour les données dans le tableur d'AppleWorks sont théoriquement suffisantes; en fait, la mémoire n'a pas la capacité de toutes les utiliser. Dépendant de la complexité de la formule, un ordinateur avec une mémoire vive de 128K permet de remplir environ 6000 cellules. Les neuf fonctions de calcul qui sont offertes par AppleWorks sont inférieures à celles qui sont offertent par des programmes autonomes. Toutefois, les opérateurs arithmétiques sont suffisants pour illustrer l'utilisation d'un tableur en comptabilité et en prévisions budgétaires dans un cadre pédagogique. Une excellente intégration est offerte entre le tableur, la base de données et le traitement de texte.

DESCRIPTION DE LA BASE DE DONNÉES

La base de données d'AppleWorks a un nombre maximum de 1350 enregistrements (ou fiches) avec un nombre maximum de 30 catégories par fiches. Une entrée peut compter jusqu'à 76 caractères. Les noms des catégories sont définissables par l'utilisateur et le programme accepte une variété de types de catégorie (numériques, alphanumériques, points flottants, etc.). Le programme peut faire un tri dans n'importe quelle catégorie et offre plusieurs critères de sélection pour les tris (=, >, <, n'est pas, ou, etc.) incluant des catégories partielles. Le programme est capable de sélectionner plus d'une catégorie à la fois aussi bien pour des chaîne que pour des mots.

ÉVALUATION DE LA BASE DE DONNÉES

L'application de gestion de la base de données d'AppleWorks offre suffisamment de puissance pour fournir une bonne introduction à la gestion des données; mais la capacité de texte est insuffisante pour permettre des applications telle que la construction d'un examen de choix multiples. La capacité théorique de données est restreinte par la mémoire vive de l'ordinateur: 750 enregistrements avec 128K. La création d'un modèle est assez facile, et les fonctions de tri et de sélection sont suffisantes. La rapidité pour effectuer un tri est satisfaisante, se basant sur une évaluation de 100 enregistrements avec 7 catégories chacun. Le fait de pouvoir visionner à l'écran les tris et les sélections avant de les imprimer est un atout pour le programme. Pendant qu'une base de données se modifie après la création initiale du modèle, lorsque des catégories sont ajoutées ou annulées, le format de présentation et le format de rapport sont perdus. Cependant, les enregistrements restent intacts. (Les utilisateurs sont avisés de prévoir des fichiers vides lors de la création initiale du modèle, au cas où de nouvelles catégories seraient nécessaires). Les rapports sont facilement sauvegardés sur une disquette afin de les ramener ou de les transférer à une autre des applications intégrées du programme. Le nom d'un rapport peut compter jusqu'à 19 caractères, ce qui est suffisant pour la plupart des applications.

DESCRIPTION DE L'INTÉGRATION

L'information à déplacer, copier ou annuler est mise en évidence, déplacée vers le Presse-papiers, et de là, au document récepteur. Un petit bruit vous signale les erreurs. La commande "localiser" (en recherchant par en avant seulement) se trouve dans les trois applications du programmme; par contre, "localiser et remplacer" se trouve seulement dans le traitement de texte.

Le genre d'imprimante à utiliser dépend beaucoup des options d'impression possibles. On peut voir le format réel à l'écran (sauf pour les commandes intégrées) si le tirage est imprimé en 10 caractères par pouce, mais il y a aussi un mode condensé qui réduit à 17 caractères par pouce. Le programme offre six grosseurs de caractères et le caractère italique peut être ajouté. Les lignes horizontales sont accommodées; par contre, les lignes verticales sont brisées. Le programme ne prévoit pas la capacité du "spool", ni de l'impression par priorité.

ÉVALUATION DE L'INTÉGRATION

AppleWorks offre une bonne intégration entre ses trois composantes. Le programme autorise jusqu'à 12 fichiers sur le "Bureau" dans la mémoire vive: des fichiers complets ou des parties de fichier se transfèrent d'un endroit à un autre en passant par le Presse-papiers. Tous les fichiers du tableur et de la base de données sont transférables au traitement de texte afin de faire la rédaction finale; cependant, des déplacements du tableur à la base de données nécessitent parfois la création de fichiers DIF ou ASCII. Le programme rend facile les additions et les annulements. Plusieurs des erreurs potentielles sont prévenues au moyen de la mise en évidence inverse et du message de sollicitation. Des messages à l'écran identifient bien les erreurs de matériel (par ex.: mauvaise diskette dans le lecteur de disque). Cependant, il est probable qu'on ait besoin de référer au manuel pour les messages des erreurs opérationnelles. La structure de commandes communes réduit efficacement le temps d'apprentissage.

Le programme n'offre pas de sécurité sous forme de mot de passe et offre seulement un nombre limité de façons pour fermer des fichiers.

Les choix d'impressions fonctionnent tel que décrits; on peut cependant rencontrer au début, des difficultés pour la configuration du programme à sa propre imprimante. L'imprimante sélectionnée par défaut est l'imprimante matricielle DMP Apple. Si vous avez une des autres imprimantes spécifiées par AppleWorks, vous devez annuler la sélection par défaut et désigner la vôtre. Si c'en est une qui n'est pas spécifiée par AppleWorks, vous devez la configurer pour AppleWorks. Les options pour numéroter les pages sont excellentes. Le programme est restreint par l'absence du "spool" et de l'impression par priorité.

AppleWorks s'intègre avec certains ensembles extérieurs (par ex.: ASCII et un ensemble de communication), mais ces fichiers ne se gardent pas en mémoire comme des fichiers sur le Bureau, alors un amorçage séparé est nécessaire.

DESCRIPTION DU MATÉRIEL D'APPUI

AppleWorks nous fournit une diskette de fichiers exemples. Il y a un manuel de référence et un manuel de travaux pratiques pour accompagner les fichiers exemples. Les deux manuels contiennent des tables de matières, des exemples, des diagrammes, etc. Une carte de référence résume les touches de commande.

ÉVALUATION DU MATÉRIEL D'APPUI

La documentation d'AppleWorks est détaillée, bien organisée, avec un bon déroulement séquentiel. Les illustrations et les tableaux se conforment très bien avec les affichages à l'écran. La diskette de fichiers exemples présente une bonne introduction point par point à l'intégration, avec des tests automatiques facultatifs. Le traitement de texte et le tableur électronique sont bien expliqués sur la diskette et dans le manuel. Cependant, l'utilisateur trouvera probablement nécessaire de manipuler les applications pour gérer les données.

Le programme est fiable et sans piège pour l'emploi normal dans une salle de classe.

SOMMAIRE

Ce programme offre une bonne intégration quand il est utilisé avec une mémoire vive de 128K, et une colonne texte de 80 colonnes. De plus, les utilisateurs d'un Apple IIe doivent augmenter la mémoire vive de leur ordinateur à 128K afin d'utiliser le programme. Avec une capacité de travail allant jusqu'à douze fichiers à la fois, il fournit un bon aperçu de l'intégration pour des élèves de sciences commerciales au niveau secondaire 10-11-12. Une bonne documentation, une diskette de fichiers exemples et une structure de commandes communes facilitent l'apprentissage.

Pour récapituler, même si AppleWorks manque d'habiletés dans la production des rapports et que ses caractéristiques sont moins raffinés que ceux des programmes autonomes, AppleWorks est un programme très fonctionnel, facile d'apprentissage, bien documenté et est idéal pour les débutants et les utilisateurs d'ordinateurs personnels. Bien que ce logiciel soit excellent pour l'introduction des élèves au concept d'intégration, les modules pris séparément, n'offrent pas suffisamment de puissance afin de préparer convenablement un élève à entrer sur le marche du travail.

STATUT

"AppleWorks" est reconnu comme ressource pédagogique de statut "DE BASE" pour les programmes de Traitement de l'informatique 10/20/30.

ACHAT

Les écoles de l'Alberta peuvent acheter cet ensemble du "Learning Resources Distributing Center" (anciennement le School Book Branch) au rabais de 40 %. Les informations concernant l'achat ne sont pas disponibles pour le moment. Cependant, les écoles peuvent s'attendre à un prix d'achat réel qui sera suffisamment moins que celui indiqué au début de ce rapport. Pour plus de renseignements, vérifiez avec le personnel du "Learning Resources Distributing Center".

Les caractères français sont probablement disponibles quand le matériel permet leur génération. Cependant, le programme n'a pas été essayé sur toutes les configurations de materiel possibles. Les utilisateurs éventuels devraient donc essayer le programme avec leur ordinateur "et" leur imprimante avant l'achat!

AUTOMATED ACCOUNTING (CANADIAN VERSION)

DESCRIPTION

Title: Automated Accounting for the Microcomputer (Canadian Version)
Authors: Baker, Allen & Klooster
Publisher: Gage Publishing
Source: 164 Commander Blvd., Agincourt, ON M1S 3C7
Subject: Business Education
Topics: General ledger, accounts payable, accounts receivable, payroll
Components: 1 diskette, student text/workbook (352p.), teacher s manual (138p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monochrome monitor, student workbook, printer (optional).
IBM PC family, 64K, monochrome monitor, student workbook, printer (optional).
Other Formats Available (not evaluated): TRS-80 Model I/III/IV

Version: 1986
Display Language: English
Cost: $47.85 (1986)
Tel. #: (416) 293-8141
Users : Grade 10

OBJECTIVES

The stated objectives of this program are to teach automated accounting principles in such a way that no prior knowledge of computers or computerized accounting is required and to provide the student with confidence in the use and understanding of a hands-on automated accounting system.

PEDAGOGICAL CONTENT DESCRIPTION

This utility diskette offers integrated computerized accounting of General Ledger, Accounts Payable, Accounts Receivable and Payroll. Within each of these four areas, available options include: creating a file, setting run time, maintaining a file, entering transactions, printing reports or returning to main menu.

When used in conjunction with the student workbook, progression is structured. It begins with an overview of computerized accounting (Chap. 1), then presents General Ledger in detail (Chap. 2-4) , progresses to Accounts Payable (Chap. 5-6) and Accounts Receivable (Chap. 7-8) and terminates with Payroll (Chap. 9-10). Note that this Canadian version contains Canadian payroll information. Each workbook chapter follows a 3-step process: principles are introduced and illustrated, students work through a sample program, and exercises built upon the sample program are presented.

PEDAGOGICAL CONTENT EVALUATION

This diskette, when used in conjuction with the workbook, offers a close correlation with modules 1-4 of the new Business Education Accounting curriculum. Information is clearly presented in tutorial format and sequencing is appropriate. Principles are introduced individually, interrelationships are effectively presented via detailed system flowcharts (which also guide the user in selecting appropriate courses of action), and projects at the end of each cycle reinforce understanding. Liberal use of well-illustrated examples combined with user disk interaction and subsequent step-by-step guided individual application exercises result in appropriate depth of coverage to meet the stated objectives. All terms are clearly defined at the beginning of each chapter.

It is unfortunate that worksheets are not addressed, although adjustments and closing entries are explained. Including an index or glossary in the user's guide would also be a helpful addition.

INSTRUCTIONAL FORMAT DESCRIPTION

Students access systems within the program by single key selections of options presented in main or sub-menus. Thereafter, alphanumeric entries (guided by on-screen prompts) are required. After data entry, all affected accounts are automatically updated and files are automatically saved when the program is formally terminated. Rate is determined by speed of data entry and system processing speed (which slows with increased amounts of data).

Each data entry screen has a standard display. The fourth line is used to flash system status messages (awaiting reply, processing data, etc.). The bottom two lines are devoted to procedural error messages which are coded by number and referenced in the workbook. If the program is used with a printer interface, documents appear only in hard copy form.

While no formal tests are provided, there is on-going evaluation in that proof entries are provided after each input and all documents are expected to balance. Out-of-balance messages together with the numerical differences are presented for each report. Success is dependent upon complete and accurate entry of all data . Final evaluation rests with the instructor (a teacher's guide complete with answer keys for all exercises is available).

INSTRUCTIONAL FORMAT EVALUATION

This courseware does an excellent job of organizing, calculating and printing accounting information and thus simulating an electronic accounting system. Instructions are explicit, student interaction is frequent and consistent, and feedback is immediate and clear. To fully appreciate this program however, students should have prior familiarization with manual accounting techniques.

Three concerns with instructional format exist: when interfaced with a printer, documents cannot be visually checked for accuracy on the screen prior to printing; the use of proofing documents may obscure the total view of integral accounting forms; and, individual T-accounts cannot be screen viewed or printed.

TECHNICAL CHARACTERISTICS DESCRIPTION

Neither color nor graphics are used; however, sound and inverse lettering are used to draw attention to procedural errors.

TECHNICAL CHARACTERISTICS EVALUATION

Displays are appropriate, uncluttered, consistent with standard accounting procedure and easily interpreted. Speed of access is dependent upon the amount of information in the files but is generally satisfactory. Generation of print reports at the end of major projects can be time consuming, particularly since no keyboard entry is allowed while printing.

Control S has to be used to stop scrolling to enable screen reading. While this is not a problem, its use is not adequately explained in the documentation.

SUMMATION

This program is generally a good utility package which a student should be able to operate independently (provided it is used in conjunction with the workbook). It requires just one disk drive to operate and it provides a comprehensive overview of a computerized accounting process.

APPLE - IBM VERSIONS

This report has been based on an evaluation of the Apple version. However, in reviewing the IBM version, the only significant difference found was the menu item "Printer Specifications" in the Apple version which allows the user to configure for a variety of printers. The IBM version omits this menu choice but the product will still work with the IBM printer.

STATUS

The Apple and IBM versions of "Automated Accounting for the Microcomputer (Canadian Version)" have been designated as **RECOMMENDED** learning resources for Acct. 10.

PURCHASE INFORMATION

This product may be purchased from the School Book Branch for an approximate package price of $46 (1986). Approximate prices for individual components are: Apple or IBM program diskette ($14), student text/workbook ($12) and the teacher's manual ($20). Each student must have his/her own program diskette; however, at the end of the course, that student's data can be erased from the diskette.

Defective diskettes will be replaced without charge within a 90 day warranty period. There is no warranty for diskettes which become inoperable through normal use.

BASIC CONCEPTS

DESCRIPTION

Title: Basic Concepts
Series: Basic Concepts of Electricity Series (#1)
Author: George S. MacRae
Publisher: Merlan Scientific Ltd.
Source: 247 Armstrong Avenue, Georgetown, Ontario L7G 4X6
Subjects: Science
Topics: Electric charge, electric currents, electric potential difference
Components: 2 Disks & backups, teacher's guide (17p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monochrome monitor
Other Formats Available (not evaluated): Commodore PET/64

Version: 1983
Display Language: English
Cost: $95.00 (1985)
Tel. #: (416) 877-0171
Users: Grades 12

OBJECTIVES

The instructional objectives for the three programs contained on this disk are:

A. ELECTRIC CHARGE -
  1. To state the law of electric charges.
  2. To state the kind of charge on electrons, protons, and neutrons and their respective locations inside atoms.
  3. To describe the difference between a positive ion and a neutral atom.
  4. To explain a positive and negative charge as a loss or gain of electrons.
  5. To state the difference between a coulomb and an elementary charge.

B. CURRENT -
  1. To distinguish between thermal agitation and current.
  2. To calculate the current in a circuit given the charge passing a point in an electric circuit in a period of time.
  3. Given two of current, charge, and time, to calculate the third.

C. ELECTRIC POTENTIAL DIFFERENCE -
  1. To show where charge gains and loses in electric energy occur as it moves through a simple electric circuit.
  2. Given the amount of charge that passes through a circuit and the change in its electric potential difference between the two points, to calculate the potential difference between the two points.
  3. Given the charges passing between two points, the change in its electrical potential energy, and the potential difference between the two points, to calculate the third.

PEDAGOGICAL CONTENT DESCRIPTION

This disk contains three programs on the basic concepts of electricity:

ELECTRIC CHARGE - This program presents a simulation of electrostatics, reviews the three basic parts of the atom (electron, proton, and neutron), explains the difference between ions and atoms, discusses positive and negative charges, and explains the difference between a coulomb and an elementary charge. Students interact via multiple choice and sentence completion questions.

ELECTRIC CURRENT - This program discusses the differences between thermal agitation and current, illustrates electric current via a simulation experiment and investigates the mathematical relationships between current, charge and time.

ELECTRIC POTENTIAL DIFFERENCE - This program illustrates the change in electric current as a current passes through a load. Potential differences across the load are investigated and the mathematical relationship between electric potential energy, charge, and potential difference is explored.

Programs two and three each include an optional drill consisting of ten problem exercises related to the program. A separate test disk contains 15 multiple choice questions based upon the three lessons. Scores, diagnostic information and an optional printout are provided.

PEDAGOGICAL CONTENT EVALUATION

The presentation and development of each concept is logical and well ordered. Animation is used effectively to illustrate textual descriptions and clarify abstract concepts. Range, content and depth are appropriate to the target audience. SI Metric format is used throughout.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of menu selection, page turning, entering single letter answers, or entering short words/phrases to complete a sentence. Questions within each lesson are presented in a fixed order, however review questions to test student understanding are randomized from a limited test bank. Correct answers receive positive textual feedback such as "Great Work" and close answers (e.g. entering a synonym for a word) receive a cautionary message such as "Hold on now". Feedback to incorrect answers informs the student the answer is wrong and the program usually allows a second attempt before presenting the correct answer. If a number of questions are answered incorrectly the program may go over the material again. Quantitative feedback is provided continually throughout the drills and encourages the student to get a perfect score.

The text diskette gives the user a choice of quantitative feedback after each question or at the end of the test. The user is also given the opportunity of reviewing the questions and is provided with an explanation of the concept that pertains to the questions answered in error. If a printer is available, a hardcopy printout of the student's score and a diagnosis of areas of weakness can be made.

Sequence and rate are user controlled; amount is program controlled.

INSTRUCTIONAL FORMAT EVALUATION

The method of moving from the concrete to the abstract via example is instructionally sound. The program allows ample student interaction and the error checking routines for close but incorrect responses is very good. Since the program expects correct calculation of significant digits, students may be advised to have a pocket calculator on hand. Although questions within the tests are effectively randomized, the fixed order of questions within the lesson presentation limits potential reuse of the disk. The quantitative feedback and analysis of error provided during the post-test should enable students to recognize their weak areas and do specific corrective study on these areas. Unfortunately student scores are not saved to disk.

TECHNICAL CHARACTERISTICS DESCRIPTION

High resolution colored graphics are used for the animation and are coupled with combination upper/lower case lettering.

TECHNICAL CHARACTERISTICS EVALUATION

Overall technical design is very good; however, the inability to exit a drill until all ten questions are completed may be considered a drawback. The ability to obtain hard copy results of the post-test along with an analysis of areas of weakness is very useful; however, since it is unlikely that each computer in a classroom would be linked to a printer, it would be advantageous to have student scores saved to disk. Displays are well formatted and the use of animation effectively contributes to student understanding. The fact that each lesson loads totally into memory upon initial booting is a program plus.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

Teacher documentation in the form of a 22 page 3-ring binder provides operating instructions, outlines program objectives, and provides an overview of the disk contents.

IMPLEMENTATIONAL SUPPORT EVALUATION

Teacher documentation is well written and easy to use. The program is easy to implement in a classroom and students should be able to work independently with little or no teacher intervention.

SUMMATION

The graphics used in this program greatly enhance student understanding of rather abstract concepts.

STATUS

"Basic Concepts" has been designated as a **SUPPLEMENTARY** learning resource for Physics 30.

PURCHASE INFORMATION

This disk is part of a series and may be purchased for $95.00 (1985) from Merlan Scientific Ltd. at the address given at the beginning of the report. The entire series may be purchased for $295.00 It consists of 4 modules: "Basic Concepts"; "Introduction to Circuits"; "Resistance"; and "Electrical Energy". All of these have been authorized as Supplementary resources and reports on them are contained in this document.

Defective diskettes will be replaced without charge within a one year warranty period. Disks which become inoperable through normal use may be replaced for $15.00.

This disk has the advantage of being capable of operation with more than one machine at a time for any particular lesson; however, such use is subject to copyright laws and any license or purchase agreement.

BOYD'S CLOTHIERS

DESCRIPTION

Title: Boyd's Clothiers
Series: Automated Accounting for the Microcomputer
Authors: Pillsbury, Ripperger
Publisher: Southwestern Publishing
Source: C/O Gage Publishing, 164 Commander Blvd. Agincourt, ON M1S 3C7
Subject: Business Education
Topics: Integrated general ledger, accounts payable, accounts receivable.
Components: 1 disk, backup, teacher's manual (42p.), student workbook (75p.)
System Requirements: Apple II+/IIe/IIc, 48k, 1 disk drive, monochrome monitor, printer advised
IBM PC, 64K, monitor, printer advised
Other Formats Available (not evaluated): TRS 80 Model III

Version: 1983
Display Language: English
Cost: $53.80 (1986)
Tel. #: (416) 293-8141
Users : Grade 10

OBJECTIVES

This simulation is designed to provide students with exposure to a computerized integrated general ledger/accounts payable/accounts receivable system and, in the process, to discover the advantages of a computerized accounting system over a manual system.

GENERAL LEDGER DESCRIPTION

In this simulation students assume the role of an accounting clerk in a single proprietorship business for a two month period and generate all the required accounting statements. A ten item sub-menu allows students to enter the chart of accounts, make journal entries, or generate a trial balance, income statement, or balance sheet. Debit and credit entries are designated by "D" and "C" and accounts are sorted by number. After entries are keyed, the user has a chance to correct any field, after which entries are automatically posted to all the affected accounts.

GENERAL LEDGER EVALUATION

Detailed instructions in the student manual make this program easy to use. The program follows established accounting procedures and provides liberal on-screen prompts to aid in error correction. The immediate on-screen balancing of each journal entry transaction provides students with immediate feedback as to whether debits equal credits. Printouts are very clear and are consistent with established accounting principles. The initial start-up of the general ledger is fairly time consuming as all affected accounts are loaded into main memory, however subsequent program response time is very quick.

The automatic calculation of a U.S. federal sales tax and references to the FICA and FUTA prove a detriment to Canadian users. Also, students must take care to exit via the "End Accounting System Option" to ensure that the input data is transferred to the disk from the computer memory.

While the program does present some payroll transactions for journalizing, it is unfortunate that a payroll section per se is not included.

ACCOUNTS RECEIVABLE/PAYABLE DESCRIPTION

The accounts receivable/payable portion of this program prints statements, invoices, credit memos, aging reports, sales reports, customer credit profiles, and schedules of accounts receivable/payable. As a simulation it is designed specifically to meet the recordkeeping needs of a particular business, therefore it does not make provision for automatic calculation of service charges or personalization of invoices nor does it provide for individual credit limits. The program handles up to 89 accounts receivable and 25 accounts payable, with the number of transactions allowed being simulation specific.

The Accounts Receivable portion of this program prints a list of customers, sales proofs, cash receipts, credit memo proofs, and customer statements. Also an aged accounts receivable ledger is presented by customer in numeric order and a summary of the aged accounts is given at the end of the session.

Similarly the Accounts Payable portion of the program will generate a vendor list by 3-digit account number, a transactions batch proof by vendor number (complete with voucher number, date, name, amount, percentage discount amount, general ledger account number, and transaction type) an accounts payable ledger by vendor complete with discounts and net amount payable, and voucher cheques.

ACCOUNTS RECEIVABLE/PAYABLE EVALUATION

When the Accounts Receivable/Payable options are chosen from the main menu, all affected accounts are loaded into main memory. This results in an initial lengthy boot time; however, subsequent transaction entries are very quick and double entry is automatically invoked (e.g. When a sales transaction is entered the computer debits the accounts receivable, credits the proper sales account and credits sales tax payable.) Users must be certain to return to the main menu and choose the "end accounting system" option in order to have the transactions saved to disk.

The accounts receivable/payable portions of this program provide a variety of transactions for the student to code. A detailed explanation of the coding is given in the student manual the first time a particular transaction is encountered. Sound is effectively used to draw a student's attention to errors and screen prompts advise in the correction procedure and the next step in the data entry activity. The built-in safeguards which prevent double issuing of cheques and inhibit deletion of accounts with current balances are excellent safeguards.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

The student manual provides detailed information on loading, coding, printing, and saving data. In addition to offering implementation suggestions, the teacher's manual offers a complete solution set to the problems posed in the student manual and includes a one-page trouble shooting guide. The entire simulation requires 6 - 8 hours for completion.

IMPLEMENTATIONAL SUPPORT EVALUATION

Provided students have had classroom instruction in the accounting cycle (i.e. have completed modules 5 and 7 of the Alberta Accounting Curriculum) they should be able to complete this simulation with a minimum of teacher intervention.

EASE OF USE EVALUATION

The menu driven system makes the program easy to use and screen prompts make error correction uncomplicated. Occasionally students are given the option of directing output to the monitor or to the printer--it would be nice if this option was available in all cases where output is generated.

SUMMATION

"Boyd's Clothier" offers a complete simulation of a single proprietorship accounting cycle. Detailed documentation accompanied by good screen prompting enables independent student use of the program. The fact that the complete module of General Ledger, Accounts Receivable, Accounts Payable is loaded into main memory before transactions are allowed results in very quick response time, however this also means that data can be lost if students fail to follow the close down procedures exactly.

The chief weaknesses of this program are its omission of payroll, the American references to government bodies which are unfamiliar to Canadian users, the fact that program use is limited to use by one student at a time, and the inability to have all documents printed to screen prior to printing.

APPLE - IBM VERSIONS

This report has been based on an evaluation of the Apple version, however a review of the IBM version revealed no significant differences.

STATUS

The Apple and IBM versions of "Boyd's Clothiers" have been authorized as **SUPPLEMENTARY** learning resources for Accounting 10.

PURCHASE INFORMATION

This product may be purchased for $53.80 (1986) from Gage Publishing at the address given at the beginning of the report. Individual component prices are: individualized student diskette ($29.60), manual ($8.65) and workbook ($15.55). Note that the package comes with a backup diskette.

If the program is used with individualized student diskettes, each diskette may be used by only one student until the simulation has been completed. Data may then be erased and the disk may be used by another student. A "driver diskette" is also available for $88.10. This diskette provides the necessary program instructions; however, data is stored on a disk supplied by the student. Thus, the driver diskette may be used by more than one student during the course - note that it can not be used by more than one student simultaneously.

Defective diskettes will be replaced without charge within a 90 day warranty period. There is no warranty for diskettes which become inoperable through normal usage.

CELLULAR REPRODUCTION

DESCRIPTION

Title: Cellular Reproduction
Author: R. Smythe
Publisher: Merlan Scientific
Source: 247 Armstrong Ave., Georgetown, ON L7G 4X6
Subject: Science
Topics: Mitosis and meiosis
Components: 1 disk and backup, user's guide (5p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, color monitor preferred
Other Formats Available (not evaluated): Available in Apple format only

Version: 1983
Display Language: English
Cost: $55.00 (1985)
Tel. #: (416) 877-0171
Users : Grade 11

OBJECTIVES

The learner will be able to:

1. Obtain background on mitosis and meiosis.
2. View simulations of mitosis and meiosis.
3. Compare mitosis to meiosis.
4. Review cell structures involved with cellular reproduction.

PEDAGOGICAL CONTENT DESCRIPTION

The two programs contained on this disk provide demonstrations of mitosis and meiosis in animal cells. Both programs offer the same menu selection: Lesson, Non-stop display, or End of Program. In addition the "Mitosis" program also offers a quiz which involves two types of questions: definitions of key words and matching of the explanation of the stages of mitosis/meiosis with their respective names.

The lesson begins by displaying a typical animal cell in which the cell components are labelled. These labels are then removed and the student is asked to type them in. This is followed by a display of each stage of the miotic/meiotic division process followed by information describing the changes taking place.

The non-stop display option shows each stage in succession without pausing to display information.

PEDAGOGICAL CONTENT EVALUATION

The range and depth of material presented on this disk is appropriate for the target audience. The program has been designed so that it can be completed in any order, although first time users are advised to complete it sequentially. A knowledge of genetics is not a mandatory prerequisite to program use.

The definitions presented are accurate; however, the emphasis on terminology may be troublesome for some students.

The meiosis portion of the program allows the user to compare analogous phases in mitosis and this is a real program strength; however, the prophase stage ignores the rather important concept of "crossing over".

Reference to user support materials is not necessary to program operation.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction in the lesson and quiz portions consists of entering words in answer to questions or using the space bar to control rate. There is no student interaction in the non-stop display. Questions generated during the lesson portion are in pre-programmed order but quiz questions are randomized. If desired, students can elect to see the list of terms that constitute correct answers during the mitosis quiz; however, use of this option will result in a lower score.

Feedback is provided only during the quiz and consists of a simple statement informing the student that his/her answer is correct/incorrect followed by immediate posing of the next question. Quantitative scores are given at the end of the quiz. Rate and sequence of progression is user controlled through menu selection and key presses; the amount of material presented at one time is program controlled.

INSTRUCTIONAL FORMAT EVALUATION

The instructional technique is appropriate to the topic and student interaction is consistent. Questioning is weak as the questions are presented at a very low taxonomic level and, in the lesson portion, are in a pre-programmed order with no return to incorrectly answered items. Also incorrect answers to questions which require a fill in the blank response merely present the correct answer with no clues or second attempts given. Evaluation is likewise weak in that while a score is temporarily displayed in the quiz section, no evaluation takes place during the lesson. Furthermore progression in the program is not related to a demonstrated knowledge of any concept.

It is unfortunate that the "Meiosis" section does not contain a quiz similar to that given in the "Mitosis" section.

TECHNICAL CHARACTERISTICS DESCRIPTION

High resolution, full-screen color graphics are used in this program.

TECHNICAL CHARACTERISTICS EVALUATION

The double-spaced displays are easy to read but letter-by-letter text generation is slow. Although most displays are clear, those cell diagrams with text at both the bottom and top of the screen tend to be cluttered. Since chromosomes are identifiable by size and shape as well as by color, use of a color monitor is not mandatory but certainly adds interest.

The program is relatively crash proof; however, error messages are not very consistent. For example, entering "nucle" for "nucleus" gives the error message "Watch your spelling" while entering "nucle" for "nuclear membrane" or "cen" for "centrioles" is acceptable.

SUMMATION

This program is easy to use and content range, sequence and depth are appropriate for high school use. The ability to compare the various phases of mitosis and meiosis is a sufficient program strength to offset the weaknesses in questioning, evaluation and technical design noted earlier.

STATUS

"Cellular Reproduction" has been designated as a **SUPPLEMENTARY** learning resource for Biology 20.

PURCHASE INFORMATION

This disk may be purchased for $55.00 (1985) from Merlan Scientific Ltd. at the address given at the beginning of the report. Defective diskettes will be replaced without charge within a one year warranty period. Disks which become inoperable through normal use may be replaced for $15.00.

Due to frequent disk interaction, this disk may be used with only one machine at a time.

CODE QUEST

DESCRIPTION

Title: Code Quest
Author: None Cited
Publisher: Sunburst Communications
Source: 39 Washington Avenue, Pleasantville, NY 10570
Subject: Problem Solving, Math
Topics: Using problems solving strategies to break codes.
Components: 1 disk & backup, teacher's guide (21p.)
System Requirements: Apple II+/IIe/IIc, 48k, disk drive, monochrome monitor
Other Formats Available (not evaluated): Atari 400,800, XL; IBM PC family; Tandy 1000, TRS-80 III, IV, Color Computer

Version: 1983
Display Language: English
Cost: $59.00 U.S.(1985)
Tel. #: (914) 769-5030
Users : Grades 4 - 7

OBJECTIVES

As a result of using this package, students will develop skills necessary to problem solving including sequencing, decoding, analyzing, pattern identification, classification and discrimination.

PEDAGOGICAL CONTENT DESCRIPTION

The student is presented with up to six successive clues to aid in the identification of a mystery object or person. The clues, written in code form, include ciphers written backwards, number and alphabetic substitution, substitution of code words for a letter, transposition of ciphers using a box grid, and substituting pictures for letters. The student must apply the problem solving skills of discrimination, pattern identification, analysis, classification, sequencing, flexibility and trial and error in an attempt to solve the problem.

PEDAGOGICAL CONTENT EVALUATION

Content is accurate, easy to read, and relevant to the target audience. The range is geared for the high average, superior and gifted students in grades four, five and six, and proves an exciting challenge for this type of student. There is no preset sequence - students may choose one of six options presented by the main menu and may use a different type of cipher for each clue given. Each problem requires extensive thinking, thus providing ample depth.

The teacher option is well laid out and is very helpful to program operation.

INSTRUCTIONAL FORMAT DESCRIPTION

Students use the space bar or the return key approximately 15-25 times to advance frames during an average problem. Alphabetic keys are used to enter solutions, and the escape key permits exit from a problem. The mystery objects are randomly selected from a bank of twenty, with room for 80 more objects to be added. Textual feedback in the form of "That's right" or "I'm sorry that is not correct" is given after each problem. There is no quantitative evaluation nor are there any pre- or post-tests.

Two branches are available: A user experiencing difficulty may access a help branch which provides a clue for solving the problem, or the user may test a theory regarding the cracking of the code by entering a test branch.

Sequence, rate, and amount are student controlled.

INSTRUCTIONAL FORMAT EVALUATION

Students are actively involved in this program. Although the program is intolerant of misspellings, it will accept sentences with no spaces between the individual words.

Random generation of the mystery object is somewhat suspect: If programs are saved and sessions continued, true random generation exists; however, if the program is merely booted without saving, the "piano" usually begins the session.

Feedback was very predictable and unfortunately no corrective feedback was included. Including some form of graphical feedback may be appropriate for the target audience. The limitation to just one "help" clue per problem offers advantages and disadvantages: It insures that students think through clues very carefully and not make silly conjectures, but on the other hand it may prove insufficient for a student who is having difficulty.

The provision of student control of sequence, rate and amount is excellent.

TECHNICAL CHARACTERISTICS DESCRIPTION

Standard size test is displayed in low resolution with high resolution used for colored graphics. Sound is not used.

TECHNICAL CHARACTERISTICS EVALUATION

Displays are well formatted; however, the use of standard size test on a color monitor tends to result in poor resolution. Color plays an important role; however, the program could be operated on a monochrome monitor. Transition between frames is smooth and the disk is generally ease to use.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

Although this program does not have a management system as such, it does include a teacher option which allows the teacher to enter, delete, or view a mystery object or to delete student saved games

The 21 page teacher's guide provides an introduction to the program objectives, background of the study of cryptography, a description of program contents and a description of each of the codes used in Code Quest.

IMPLEMENTATIONAL SUPPORT EVALUATION

This program is easy to use in the classroom. Although students are required to do a fair amount of alphabetic input, the hunt-and-peck typist was not deterred. The teacher option was easy to operate even by users with no previous computer knowledge. The guide is well laid out, offers a wealth of information, and provides suggestions for adaptation to any subject area.

The capacity of saving up to 100 objects is excellent.

SUMMATION

This package develops problem-solving skills in an interesting and motivating manner.

STATUS

"Code Quest" has been authorized as a **SUPPLEMENTARY** learning resource for grades 4 - 7 in Math and Problem Solving subjects.

PURCHASE INFORMATION

This product may be purchased for $59.00 U.S. (1985) from Sunburst Communications at the address given at the beginning of the report. A lab pack, consisting of 10 diskettes and one set of teacher documentation is available for $177. U.S. (1985). Sunburst Communications offers a lifetime warranty on their courseware products and will replace defective diskettes at no charge.

This diskette has the advantage of being capable of operation with more than one machine at a time if only one mystery object is investigated; however, such use is subject to copyright laws and any license or purchase agreement.

COUNTERS

DESCRIPTION

Title: Counters
Author: Thomas C. O Brien
Publisher: Sunburst Communications
Source: 39 Washington Avenue, Pleasantville, NY 10570
Subjects: Mathematics, Early Childhood
Topics: Counting, addition, subtraction
Components: 1 disk with backup, teacher's guide (22p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, colour monitor
Other Formats Available (not evaluated): Available in Apple format only

Version: 1983
Display Language: English
Cost: $59.00 US (1985)
Tel. #: (914) 769-5030
Users: Grade 1

OBJECTIVES

This program is designed to give children hands-on experience with counting and with counting as the basis of addition and subtraction.

PEDAGOGICAL CONTENT DESCRIPTION

This drill and practice program consists of three parts: counting, addition and subtraction. Counting and addition have five levels of difficulty, subtraction has two levels. Counting involves counting objects and matching arrangements of objects to numerals one through nine. Counting is sequenced in numerical order at Level 1 and proceeds to random order arrangements in Level 5. Addition at Level 1 begins with two collections of objects which the user combines to produce a single collection and then progresses sequentially to number sentences at level 5. The sums never exceed 9. When a user answers incorrectly, the program is sequenced so that the next problem will be an easier one. In the subtraction program, Level 1 deals with the separation of one collection into two parts. One part is shown on the screen and the user must reconstruct the other part. Level 2 involves number sentences with the largest number never exceeding 9.

PEDAGOGICAL CONTENT EVALUATION

The range and sequence of the content are both appropriate and effective for the target audience. The user, with teacher supervision, can choose any one of three activities at any level. The sequencing from concrete to abstract is effective. The amount of content can be controlled by the teacher in order to accommodate the needs of the individual student. The visual explanations of wrong answers will likely need some teacher interpretation. There is sufficient practice at each level. The drills seem to hold the interest of the users and are appropriate for computer use. The content is accurate using large visual numbers and images which are appropriate for the intended users.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of pressing any key to select the correct answer when it appears on the screen. Pressing any key also allows the student to go on to the next question. The arrow and return keys must be pressed to access different programs but the documentation suggests that this be done by an adult.

In most drills the questions are selected randomly from a limited data bank; however, in Level 1 of counting the objects appear in numerical order beginning with one object and ending with nine objects. When a user answers incorrectly, the program is set so that the next problem will be an easier one.

Two types of feedback are used in this program. Correct answers are rewarded with flashing numbers or animated graphics and audio beeps. An incorrect response results in a large "X" across the incorrect answer. A visual explanation is then given. There is no quantitative feedback.

No pre- or post-tests are included in this program.

INSTRUCTIONAL FORMAT EVALUATION

The instructional format is effective with activities that are suitable for the the intended audience. Student interaction is appropriate and effective; however, due to the method of questioning chosen, some questions take a long time to present. The student can learn through manipulation of objects in the content. Some students may have difficulty counting graphic objects from right to left. The use of animated graphic objects is appealing to this age group. There is no time limit and if a student misses acknowledging the correct answer, the question reappears in a few seconds. The program has no allowance for the correction of wrong answers. The questioning technique and feedback are appropriate and effectively meet the objectives of the program; however, it is unfortunate that no quantitative feedback is provided. The visual assistance which is provided as part of the negative feedback may need adult interpretation for some of the students. The lack of evaluative and record keeping tools is a weakness. The program will require some teacher or adult supervision when an assessment of the student progress is desired.

TECHNICAL CHARACTERISTICS DESCRIPTION

This program uses a combination of graphics, color and sound with extra large numerals. Enlarged print is used in the menu while standard size print in upper and lower case appears in the instructions. A color monitor is desirable.

TECHNICAL CHARACTERISTICS EVALUATION

Displays are well designed, appropriate and effective for most intended users. Color and graphics with animation add to the effectiveness of the program. Sound is not optional and will likely cause some distraction if the program is used in the classroom. Instructions are available on the disk but these are intended for the teacher. The program is easy to use and appears to be reliable. The teacher will need to give the student some assistance at the initial stages but this will likely be limited. Flashing graphics are used throughout the program; at times this is limited to digits or animated figures but at other times the entire screen will flash on and off in different colors. Teachers of students with epilepsy should be aware that there is some possibility that such flashing may trigger seizures.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

The student will need to be able to count to nine and recognize the numerals to 9.

No management system is included in this program. The teacher documentation includes a rationale for the concept of counting, a description of the three programs, suggested follow-up activities and information on computer use. There are no user support materials included.

IMPLEMENTATIONAL SUPPORT EVALUATION

The entry competencies are appropriate for the target audience. The documentation provides sufficient information for easy use of the program. The lack of a management system does not preclude the use of the program but the addition of such a system would make it more useful. The program is easily adapted to a classroom setting and can be readily implemented by a teacher with minimal computer competency. Little supervision is required after the initial instruction.

SUMMATION

The content, instructional format and technical quality are generally good for the intended users. A management system would be a beneficial addition for the teacher. This could provide the teacher with evaluative information and thus reduce student supervision time. Allowing a second chance to obtain the correct answer before the explanation is given would also improve the program.

STATUS

"Counters" has been authorized as a **SUPPLEMENTARY** learning resource for Grade 1.

PURCHASE INFORMATION

This product may be purchased for $59.00 U.S. (1985) from Sunburst Communications at the address given at the beginning of the report. A lab pack, consisting of 10 diskettes and one set of teacher documentation is available for $177. U.S. (1985). Sunburst Communications offers a lifetime warranty on their courseware products and will replace defective diskettes at no charge.

This disk has the advantage of being capable of operation on more than one computer at a time provided that only one activity is accessed; however, such use is subject to copyright laws and any license or purchase agreement.

DIVIDING FRACTIONS

DESCRIPTION

Title: Dividing Fractions
Author(s): Don Ross
Publisher: Microcomputer Workshops
Source: c/o CBS Interactive Learning, One Fawcett Place, Greenwich, CT 06836
Subjects: Mathematics
Topics: Dividing fractions with the cancelling or reducing process
Components: 1 disk, backup, teacher's guide (7p.), management system guide (9p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monitor
IBM PC family, 64K, monitor
Other Formats Available (not evaluated): TRS-80 Models III/IV, Atari, Commodore 64
Alberta Education Call No.: QA 117 D618 1984

Version: 1984
Display Language: English
Cost: $29.95 US (1985)
Tel. #: (203) 622-2500
Users: Grades 7 - 8

OBJECTIVES

This package is designed to give students practice in dividing fractions and to facilitate the understanding of the cancelling or reducing process in order to simplify the problem.

PEDAGOGICAL CONTENT DESCRIPTION

The program consists of a brief optional tutorial along with a drill on dividing fractions. In the tutorial, the user is stepped through the solution of a division question - 1) reciprocate the divisor, 2) reduce/cancel the two fractions being divided, 3) multiply and, 4) if necessary, change an answer from an improper fraction to a mixed numeral.

Following the instructions, the user chooses the number of questions (s)he wishes to attempt (up to 99). In order to solve the question, the user must decide what operation to perform (reciprocate, cancel/reduce or multiply). Upon inputting the correct operation, (s)he must then perform the operation. The computer modifies the question appropriately and then resumes the solution process. If possible, final answers are to be converted to mixed numbers.

PEDAGOGICAL CONTENT EVALUATION

Content range, sequence and depth are all somewhat weak. The range of the content is very limited in that only one small skill is addressed and there is no treatment of dividing fractions with a whole number divisor or with a mixed number divisor. Within the limited range, there is no sequential development, such as progressing from no cancellations through to one and two cancellations.

The depth of the practice is satisfactory as the user may select as many questions as (s)he desires. However, the depth of the instruction is very limited. Only one example is provided and the student can progress through it without understanding by merely following the directions. The tutorial is further weakened by poor clarity. Although step by step directions are given, their purpose could be lost in the specifics of entering the numbers. Less use of terminology (e.g. "Numerator of reciprocated (inverted) fraction") would also be advantageous.

As it is highly doubtful whether the tutorial is sufficient to ensure understanding of the process involved, use of the disk would be limited to students who have had prior instruction in the process. For these students, the structured step by step procedures for solving questions could be beneficial. There is sufficient guidance given in the structure and in the feedback hints to be of benefit either as a review or for remediation. For these purposes, the weaknesses of sequence, range and depth would not be serious.

INSTRUCTIONAL FORMAT DESCRIPTION

Correct answers result in the program proceeding through the solution process until an answer is obtained. Errors in either the selection of the correct operation or in the input of numbers result in a brief remedial statement. The correct answer must be entered before the user can proceed.

At the end of each question, quantitative feedback is given showing the number of procedural errors and the number of computational errors. At the end of the drill, similar quantitative feedback is available for all the questions attempted.

The rate and number of questions are controlled by the user. Questions are randomized and the user may do as many as (s)he wishes.

INSTRUCTIONAL FORMAT EVALUATION

Students act as mere direction followers in the instructional portion of this program. True interactive examples within the tutorial would be more appropriate. The student interaction in the drill is effective and clear. As the user participates through a very structured problem solving approach, this program would be best for remedial purposes. After a user has mastered this skill, the continued repetition of the structured questions could become tedious.

The feedback on errors is good as corrective feedback is used to explain why an error was made. Error trapping has been well designed and common errors are all anticipated.

The option given to students of choosing the number of problems to attempt and the option of exit at any time are excellent. While questions supposedly are randomized, rebooting the program often results in the same initial sequence of questions.

Another weakness is the lack of an evaluation component (pre-test/post-test) and the lack of different levels of difficulty. These would provide more flexibility in dealing with students with varying abilities.

TECHNICAL CHARACTERISTICS DESCRIPTION

Text and numbers are presented in standard size print, upper and lower case letters. During the solution of the question, the screen is broken into three areas: original problem, work space and messages. As the question is solved, the work space is modified but the original question remains untouched. The messages area provides instructions and information to the user.

The inverse mode is used to highlight important pieces of information.

TECHNICAL CHARACTERISTICS EVALUATION

Displays are generally well formatted and easy to read. The use of the three parts allows necessary information to be retained, transformations to be shown clearly and messages to be clearly and efficiently shown to the user.

The program is not consistent in the method of registering inputs. While it is usually necessary to press return as a signal that the answer is to be accepted, in some instances the input is acted upon without pressing return. This means students are unable to correct an entry entered in error and therefore they have an error registered against them.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

Implementational support consists of a 7 page teacher guide which provides a brief walk-through of the program along with an explanation of the error categories. The management system is described in a separate 9 page document. Functions include working with one class, setting difficulty of problems, creating a class, renaming or deleting a class and changing the password. In working with one class, the teacher may list, edit, add and delete student names. In addition, (s)he may rank students, see student profiles, see class profiles, see grade plots and erase grades. If a student has been entered into a class list, his/her grades will be automatically stored; other students may work with the program but without any record keeping. A maximum of 6 classes, each with 35 students can be entered.

IMPLEMENTATIONAL SUPPORT EVALUATION

An excellent management system provides an abundance of reporting material (individual student reports, various ranked reports, etc) in either soft or hard copy form. The individual student reports are very detailed and include the number of problems completed, how many were correct/incorrect, and a total percentage score. The reliability of some of the ranking reports may be suspect as the system uses an overall average in its computations. (For example, a student may get nine procedural errors in one problem and none in the others, but his/her ranking would be low because all nine errors are used in the average, even though they all occurred in one problem).

The documentation incorrectly indicates that the teacher has the ability to set the difficulty level for a student. It is unfortunate that this function was not provided on this particular disk as this would have resolved some of the sequencing and range problems described earlier.

The teacher's guide is clearly written. Students with little or no computer background should be able to use the program independently.

SUMMATION

This package offers the strengths of a step-by-step problem solving approach to dividing fractions, corrective feedback techniques, good technical design and an excellent management system. These strengths are weakened however by somewhat limited content range and sequence and by instruction offered in a passive rather than interactive learning format.

These weaknesses and the methodical step by step approach used to solve the problems make the program most appropriate for remediation of the very specific topic covered within the content.

APPLE - IBM VERSIONS

Both the Apple and the IBM versions offer parallel content and instruction, however three technical differences were noted:

1. The IBM version does not offer a data management system.
2. The Apple version asks for manual entry of the fraction to be reciprocated; the IBM version allows use of the spacebar to highlight the fraction to be reciprocated.
3. The Apple version allows the user to choose any number of problems; the IBM version imposes an upper limit of nine questions.

Users are reminded that the IBM version requires that DOS be loaded and saved on the program disk prior to initial use of the program (note that either DOS version 1.1, 2.0, or 2.1 will work).

STATUS

The Apple and IBM versions of "Dividing Fractions" have been designated as **SUPPLEMENTARY** learning resources for grades 7 & 8.

PURCHASE INFORMATION

This product may be purchased for $29.95 U.S. (1985) from CBS Interactive Learning at the address given at the beginning of the report. Lab packs are available in the following quantities and prices: 10 copies @ 3 x list price; 15 copies @ 4 x list price; 20 copies @ 5 x list price; 25 copies @ 6 x list price. The company provides a life time guarantee against defective diskettes and will replace worn out diskettes without charge at any time.

The disk has the advantage of being capable of operation with more than one machine (if access to the management system is not needed); however, such use is subject to copyright laws and any license or purchase agreement.

EARLY GAMES FOR YOUNG CHILDREN

DESCRIPTION

Title: Early Games for Young Children
Author: John W. Paulson
Publisher: Springboard Software Inc.
Source: 7808 Creekridge Circle, Minneapolis, MN 55435
Subject: Early Childhood
Topics: Addition, subtraction, alphabet, number recognition, drawing, counting
Contents: 1 disk, teacher's guide (6p.)
System Requirements: Apple II+/IIe/IIc, 48k, 1 disk drive, monitor
Other Formats Available (not evaluated): IBM PC, Atari, Commodore 64
Alberta Education Call No.: GV 1480 P332 1983

Version: 1983
Display Language: English
Cost: $34.95 U.S. (1985)
Tel. #: (612) 944-3915
Users : Grade 1

OBJECTIVES

The inferred objectives of this disk are to build familiarity with numbers, to teach numerical sequence, to develop matching skills, to introduce addition and subtraction problems together with their related mathematical symbols, to teach the alphabet sequence, to reinforce the concept of same and different, and to provide creative drawing experience on the computer.

PEDAGOGICAL CONTENT DESCRIPTION

This disk contains nine games with the following foci:

MATCH NUMBERS - number recognition to 9.
COUNT - counting to 9.
ADD - addition to 9.
SUBTRACT - subtraction from 9.
MATCH LETTERS - letter recognition.
ALPHABET - the sequence of the letters of the alphabet.
NAMES - practice spelling and entering names.
COMPARE SHAPES - finding the odd shape out of four given shapes.
PICTURE DRAW - drawing and coloring pictures on an open computer screen.

The program uses large colored numbers and letters to develop familiarity concepts. The "+","-", and "=" signs are used to develop addition and subtraction concepts. Tutorial branches are available in five of the games.

PEDAGOGICAL CONTENT EVALUATION

The range of content is appropriate for the intended target audience. If the programs are completed in order, a logical, progressive sequence is offered. An adult would need to initially describe operating procedures to the user; however, after an introduction, students should be able to follow the visual prompts independently.

Since good eye/hand coordination is required to accurately manipulate the cursor in "Picture Draw", younger students may require adult intervention. Also the abstract concept of saving a game may be difficult for them to comprehend. Users may find the geometric shapes (circles, squares, etc.) that are used in the "Compare Shapes" game may not be as interesting as if actual objects were depicted.

INSTRUCTIONAL FORMAT DESCRIPTION

By the time all nine games have been played, students will have used all the alpha and numeric keys, the escape key, the control key and the space bar. Questions are randomly generated with all number questions limited to 9 as the upper limit. The "Count", "Add" and "Subtract" games introduce progressively more difficult questions as the student answers successfully.

Positive feedback consists of a peppy musical interlude sometimes accompanied with graphics (e.g. a chirping bird), while negative feedback produces a deep and slow tone and flashes the correct answer. Five of the programs provide a tutorial for students experiencing difficulty. Numbers and letters posed in sequence, flashing prompts and color are used to teach the concept under consideration. The program does not offer quantitative feedback.

The user controls sequence, rate, and amount.

INSTRUCTIONAL FORMAT EVALUATION

User interaction encourages learning through manipulation and thus is appropriate for the target audience. User control of sequence, rate and amount are likewise effective. In most cases, if the user types in an incorrect answer, the correct answer will be displayed and the user must enter it before being allowed to progress, thus providing good reinforcement of the correct answer.

TECHNICAL CHARACTERISTICS DESCRIPTION

High resolution graphics are used to produce large size, colored numerals and letters. Sound is used to provide reinforcement and motivation.

TECHNICAL CHARACTERISTICS EVALUATION

Color, sound and graphics are used effectively. Random selection has been efficiently employed in that questions which are repeated are depicted in a different color or texture from their initial presentation.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

The accompanying 28 page teacher's manual outlines the concepts and skills covered in each of the nine programs. Suggestions for individual and classroom activities to extend learning are also included.

IMPLEMENTATIONAL SUPPORT EVALUATION

The documentation contains all the features necessary to make the program easy to use in the classroom. Suggestions for additional activities are effective. The disk is easy to use in the classroom as minimal computer competency is required by either the teacher or students. Program strength would be improved if a management system were included to allow teacher control over the number of questions attempted and to provide a record of the number of correct responses on the first try.

SUMMATION

This disk makes effective use of color, animation and sound to provide an interesting introduction to numbers, letters, comparison and drawing skills.

SUGGESTIONS TO THE PRODUCER

The strength of this program as a classroom instructional tool could be improved by incorporating a management system to allow teachers control over the number of and type of questions a student attempts and to provide a record of the number of questions answered correctly on the first try.

STATUS

"Early Games for Young Children" has been designated as a **SUPPLEMENTARY** resource for Grade 1.

Purchase Information

This product may be purchased for $34.95 U.S. (1985) from Springboard Software at the address given at the beginning of the report. Defective diskettes will be replaced free of charge within a 30 day warranty period. Thereafter, replacements may be obtained for a $5.00 U.S. charge provided that the warranty card has been returned and that the product is still being manufactured.

This diskette has the advantage of being capable of operation with more than one machine at a time provided that only one activity is accessed; however, such use is subject to copyright laws and any license or purchase agreement.

EASY AS ABC

DESCRIPTION

Title: Easy as ABC
Author(s): None Cited
Publisher: Springboard Software Inc
Source: 7808 Creekridge Circle, Minneapolis, MN 55435
Subjects: Language Arts
Topics: Identifying letters, learning alphabetical order, matching upper & lower case letters
Components: 1 disk, teacher's guide (24p)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, color monitor preferrable
Other Formats Available (not evaluated): IBM PC/PCjr, Commodore 64

Version: 1984
Display Language: English
Cost: $ 39.95 U.S. (1985)
Tel. #: (612) 944-3915
Users: Grades 1-2

OBJECTIVES

This program is designed to develop a child's ability to identify letters, put letters into alphabetical order and match upper and lower case letters.

PEDAGOGICAL CONTENT DESCRIPTION

This program covers all the letters of the alphabet in five game formats.

The games include:

1. MATCH LETTERS - This game develops discrimination and matching skills with upper and lower case letters.
2. DOT TO DOT - Sequencing of the alphabet by joining lettered dots in the correct order is involved in this game. It begins with "A", but after that, the first letter can be from anywhere in the alphabet. Once the dots are joined correctly a colorful picture appears.
3. LEAPFROG - This game involves sequencing of a series of three letters from anywhere in the alphabet.
4. LUNAR LETTERS - The child must identify the first letter from a series of six letters and then complete the sequence.
5. HONEY HUNT - Recognition of upper and lower case letters is developed in this game.

PEDAGOGICAL CONTENT EVALUATION

The range and depth are appropriate for the target audience. Since there are no units or groupings of alphabetic sequences, the child can continue to use the program for an indefinite period of time. The alphabetic sequences are randomly selected with no repetition of incorrect sequences. The order of the introduction of letters may not follow the order of specific reading series; nevertheless, the program provides effective practice. The content is appropriate for the media with relevant visual images enhancing the program.

INSTRUCTIONAL FORMAT DESCRIPTION

The student interaction consists of menu selection, letter choices using arrow keys, the I,J,K and M keys, or joystick to control cursor movement and the space bar or joystick to pick up or drop letters into the correct positions. The ESC key is used to return to the main menu.

All questions are presented randomly from a limited data bank. Feedback is provided after each user response. A correct response is rewarded with sound and the flashing of the letter which was correctly positioned or chosen. In some of the games, such as LEAPFROG and HONEY HUNT, animation is also used to provide feedback. In MATCH LETTERS and DOT TO DOT, the correct solution is rewarded with a full screen picture of the object or the animal named. An incorrect response is indicated by a double beep and the flashing of the correct letter. There is no quantitative feedback. No pre- or post-tests are provided. Although no branching is provided, an explanation of cursor movement and directions for the picture menu for the games is provided for teacher or parent use.

INSTRUCTIONAL FORMAT EVALUATION

The student interaction is appropriate for the users with effective cues and prompts. The use of arrow keys or keyboard letters for cursor movement requires eye and hand co-ordination but can be handled readily after some practice. The feedback is immediate and appropriate.

TECHNICAL CHARACTERISTICS DESCRIPTION

Larger than normal upper and lower case letters are used throughout the program. Color and sound are used in the program with sound being an option. High resolution graphics are used in the program with some animation.

TECHNICAL CHARACTERISTICS EVALUATION

Text, color, sound and graphics are all appropriate and effective for the target audience. Displays are clear and readable with appropriate character size and effective use of upper and lower case letters. Although color is used, this program may be used effectively on a monochrome monitor. The program is user friendly and can be used independently by the student once the cursor movement has been mastered.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

No management system is included in this program. The teacher documentation includes the program operation instructions, an overview of each game with the concepts and skills presented, instructions for playing each game, and suggested additional activities following the games. No additional user support materials are provided.

IMPLEMENTATIONAL SUPPORT EVALUATION

The teacher documentation is well organized and easy to use. This program is adaptable to a variety of classroom environments and is appropriate for use with kindergarten and beginning grade one students. Although students require a minimal amount of teacher supervision to use the program after an orientation, it would be helpful and effective to have someone to either identify the letters by name and sound for the student or to check the student's knowledge of letter names and sound as they are being used in the program. The additional activities suggested in the documentation will generally require the teacher or an adult to work with the student. The teacher needs only minimal computer competency to use this program.

SUMMATION

The major strength of this program is that it provides an interesting way for the students to learn the alphabet, alphabetic sequences and to use both upper and lower case letters. The variety which is provided by the game approach is highly motivating and provides a great deal of practice. The program is also very easy to use. The inclusion of the letter name or sound would be beneficial.

STATUS

"Easy as ABC" has been authorized as a **SUPPLEMENTARY** learning resource for grades 1 - 2.

PURCHASE INFORMATION

This product may be purchased for $39.95 U.S. (1985) from Springboard Software at the address given at the beginning of the report. A backup diskette may be purchased for $12 U.S.

If within 30 days of the date of purchase, the owner decides that the software is not helping to develop the child's creative skills, Springboard will refund the purchase price. Defective diskettes will be replaced without charge within a 30 day warranty period. After 30 days, a replacement for a defective diskette can be obtained by sending the original product and $5.00 to the manufacturer provided that an extended warranty card has been filed.

Due to frequent disk interaction, this disk may be used with only one machine at a time.

ELECTRICAL ENERGY

DESCRIPTION

Title: Electrical Energy
Series: Basic Concepts of Electricity Series (#4)
Author: George S. MacRae
Publisher: Merlan Scientific Ltd.
Source: 247 Armstrong Avenue, Georgetown, Ontario L7G 4X6
Subject: Science
Topics: Energy in circuits, electric power, cost of electricity
Components: 2 disks & backups, teacher's guide (17p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monochrome monitor
Other Formats Available (not evaluated): Commodore PET/64

Version: 1983
Display Language: English
Cost: $95.00 (1985)
Tel. #: (416) 877-0171
Users: Grade 12

OBJECTIVES

ENERGY AND CIRCUITS:

1. Given three of the current in an electrical device, the potential difference across it, the time for which the current flows, and the energy used (in joules), to calculate the fourth.

ELECTRIC POWER:

1. Given the time taken to consume a certain amount of energy, to calculate the power used.
2. Given the potential difference across a circuit and the current through it, to calculate the power of the circuit.
3. Given two of the current in a circuit, the potential difference across it and the power used, to calculate the third.

COST OF ELECTRICITY:

1. Given the power rating of an appliance and the time for which it is operated, to calculate the energy used in units of kilowatt hours.
2. Given the power rating of an appliance, the time for which it is operated, and the cost of electricity (per kilowatt hour), to calculate the cost of the energy used.

PEDAGOGICAL CONTENT DESCRIPTION

The programs on this disk cover the following concepts:

1. ENERGY IN CIRCUITS - defines $E=VQ$ and illustrates how this equation is combined with $I=Qt$ to form $E=VIt$.
2. ELECTRIC POWER - defines $P=E/t$ and illustrates how this equation is combined with $E=VIt$ to form $P=VI$.
3. COST OF ELECTRICITY - redefines $E=Pt$ using more appropriate (larger) units (e.g. for energy-kilowatt hours) for E, P, and t to determine cost.

Each of the programs contains an optional drill consisting of ten problem exercises related to the permutations of the formula covered in the lessons. A separate test disk contains 15 multiple choice questions based upon the three lessons. Scores, diagnostic information and an optional printout are provided.

PEDAGOGICAL CONTENT EVALUATION

The presentation and development of each concept is logical and well ordered and animation is used effectively to reinforce concepts. Definitions and explanations are provided where necessary. Range, content and depth are appropriate to the target audience, however two minor errors in content were noted:

1. A spelling error ("recomment" for "recommend") occurs at the end of the drill on electric power.
2. The user is informed the test will consist of 12 questions, however 14 questions are presented.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of menu selection, page turning, entering single letter answers, or entering short words/phrases to complete a sentence. Questions within each lesson are presented in a fixed order, however review questions to test student understanding are randomized from a limited test bank. Correct answers receive positive textual feedback such as "Great Work" and close answers receive a cautionary message such as "Almost, but form could be improved". Feedback to incorrect answers informs the student the answer is wrong and the program usually allows a second attempt before presenting the correct answer. If a number of questions are answered incorrectly the program may repeat the instructional material again. Quantitative feedback is provided continually throughout the drills and encourages the student to get a perfect score.

The test diskette gives the user a choice of quantitative feedback after each question or at the end of the test. The user is also given the opportunity of reviewing the questions and is provided with an explanation of the concept that pertains to the questions answered in error. If a printer is available, a hardcopy printout of the student's score and a diagnosis of areas of weakness can be made.

Sequence and rate are user controlled; amount is program controlled.

INSTRUCTIONAL FORMAT EVALUATION

This program allows ample student interaction and the error checking routines for close but incorrect responses is very good. Since the program expects correct calculation of significant digits, students may be advised to have a pocket calculator on hand. The fill in the blanks questions do not accept abbreviations consistently. For example, the program accepts "s" as an abbreviation for second but will not accept "J" as an abbreviation for joule. Although questions within the tests are effectively randomized, the fixed order of questions within the lesson presentation limits potential reuse of the disk. The quantitative feedback and analysis of error provided during the post-test should enable students to recognize their weak areas and do specific corrective study on these areas. Unfortunately student scores are not saved to disk.

TECHNICAL CHARACTERISTICS DESCRIPTION

High resolution graphics are coupled with combination upper/lower case lettering.

TECHNICAL CHARACTERISTICS EVALUATION

Overall technical design is very good, however the inability to exit a drill until all ten questions are completed may be considered a drawback. The ability to obtain hard copy results of the post-test along with an analysis of areas of weakness is very useful; however, since it is unlikely that each computer in a classroom would be linked to a printer, it would be advantageous to have student scores saved to disk. Displays are well formatted and the use of animation effectively contributes to student understanding. The fact that each lesson loads totally into memory upon initial booting is a program plus.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

Teacher documentation in the form of a 22 page 3-ring binder provides operating instructions, outlines program objectives, and provides an overview of the disk contents.

IMPLEMENTATIONAL SUPPORT EVALUATION

Teacher documentation is well written and easy to use. The program is easy to implement in a classroom and students should be able to work independently with little or no teacher intervention.

SUMMATION

The graphics used in this program greatly enhance student understanding of rather abstract concepts. Helpful feedback, printed quantitative analysis of student learning, and branching for review all contribute to the instructional strength of this package.

STATUS

"Electrical Energy" has been designated as a **SUPPLEMENTARY** learning resource for Physics 30.

PURCHASE INFORMATION

This disk is part of a series and may be purchased for $95.00 (1985) from Merlan Scientific Ltd. at the address given at the beginning of the report. The entire series may be purchased for $295.00 It consists of 4 modules: "Basic Concepts"; "Introduction to Circuits"; "Resistance"; and "Electrical Energy". All of these have been authorized as Supplementary resources and reports on them are contained in this document.

Defective diskettes will be replaced without charge within a one year warranty period. Disks which become inoperable through normal use may be replaced for $15.00.

This disk has the advantage of being capable of operation with more than one machine at a time for any particular lesson; however, such use is subject to copyright laws and any license or purchase agreement.

ENTERPRISE SANDWICH SHOPS

DESCRIPTION

Title: Enterprise Sandwich Shops
Author: Lewis
Publisher: McGraw Hill Ryerson
Source: 330 Progress Avenue, Scarborough, Ontario, M1P 2Z5
Subject: Business Education
Topics: Introductory business, retailing, management, marketing, accounting, small business management
Components: 1 disk, user's manual (98p.)
System Requirements: Apple II+/IIe/IIc, 32K, 1 disk drive, monochrome monitor, 80 column printer
IBM PC family, 64K, monochrome monitor, 80 column printer
Other Formats Available (not evaluated): Available in Apple and IBM formats only.
Alberta Education Call No.: HD 30.26 L675 1983

Version: 1982
Display Language: English
Cost: $268.65 (1984)
Tel. #: 800 223-4180
Users : High School

OBJECTIVES

"Enterprise Sandwich Shops" is designed to simulate business conditions found in a free enterprise system and to provide students with an understanding of entrepreneurship, marketing, retailing and management. Students will be able to describe the impact of pricing, salaries, taxes and other operating costs on net income; cite factors that affect productivity; read and interpret basic accounting statements; and, explain the effects of such external forces as weather, competition and advertising on demand.

PEDAGOGICAL CONTENT DESCRIPTION

The disk is designed as a data generator which, given student input from up to four students/student teams, produces monthly reports for up to an eight month period. These will detail market information, confidential business information and an income, cash-flow and balance sheet for each of the four Enterprise Sandwich Shops. Students can see the effects of marketing decisions on a company's income and profits, and the effects of other factors such as weather and competition.

The accompanying manual provides reference material on how to use the disk, suggestions for classroom implementation, transparency masters, instructor's materials, and reproducible student handouts. The teacher alone accesses the disk to input student decisions and to gain printed reports which reflect the results of those decisions. These reports are then used as the basis for classroom discussion of such concepts as marketing strategies, economic forecasts, and production management. Students are encouraged to use the results from the previous month's reports to determine the effects of supply and demand, advertising, under/over production and competition on total sales. Their aim is to improve profit given factors such as cost of goods sold, transportation charges, employee salaries and overhead costs.

PEDAGOGICAL CONTENT EVALUATION

A wide range of business and marketing topics can be enhanced when used in conjunction with this material. Marketing skills and strategies, advertising, taxation, business finance, pricing and competition are all part of the simulation.

Content range, sequence and depth are largely dependent upon the teacher's implementation strategies. To a limited extent, teachers can control depth by instructing students to begin with a very limited menu selection. As confidence is gained, they can then extend the market conditions by expanding the menu, adding equipment and personnel, acquiring loans to promote expansion, etc. The generated printouts have the potential to be excellent discussion stimulators and they do provide a realistic portrayal of market conditions; however, students would require a basic understanding of accounting reports combined with strategic teacher questioning to enable them to fully appreciate the conditions which cause market fluctuations. The introduction of periodic changes in market conditions (e.g. new competition, a cost of living raise given to employees, health department citations, charitable donations, etc.) and the assessment of a $50 accountant fee for each error occurrence (e.g. failure to remain open for the required number of hours, allowing an employee to work more overtime than allowed by law, failure to make a minimum payment on a loan, etc.) add realism to the simulation.

INSTRUCTIONAL FORMAT DESCRIPTION

This program is designed to be used by four teams of students with 3-5 persons/group in one hour class periods delivered once/twice a week for a total period of 2-9 sessions. Neither the disk nor the manual are intended to stand alone, but rather to act as a teacher administration tool to supplement class discussion of free enterprise, pricing, marketing, production management, retailing and management decision making.

Student involvement centers on strategy planning. They record their decisions on a planning sheet and the teacher in turn enters these decisions into the computer. Feedback is provided in the form of printed reports of sales, cash flow, income statements, etc. which students must then analyze to determine their next course of action. Assessment of student performance is based upon which team generates the most profit from their business operation as shown via the profit and loss statement. Competitive standings are shown both as profit/loss for the month in question as well as total profit/loss to date.

INSTRUCTIONAL FORMAT EVALUATION

Conscientious teacher preparation is required to use this program effectively. In addition, teachers must be prepared to spend at least one-half hour to input student decisions and generate the necessary reports.

The manual includes excellent implementation suggestions, catchy transparency masters and clearly written disk use instructions.

It would be helpful if the program itself could provide more planning assistance to the student in the form of additional strategy sheets (e.g. break even point, pricing policies, planned sales, personnel production and cost, etc.) and/or by including computer generated prompts to guide students in selection of an appropriate course of action.

TECHNICAL CHARACTERISTICS DESCRIPTION

Graphics, color and sound are not used in this program. All printouts are generated in galley form in standard 40 column text with combination upper/lower case lettering.

TECHNICAL CHARACTERISTICS EVALUATION

Teacher input procedure for generating printouts is clearly outlined both on the disk and in the reference guide and ample opportunity is given to check the accuracy of entered data and change it if necessary. Displays are clear and input prompts are consistent. Disk interaction, both on initial load and on movement from one menu to another, tends to be slow. While the printer can produce up to nine copies of each report, it is far quicker to print only one copy per team and xerox other copies as necessary.

SUMMATION

Although very costly, "Enterprise Sandwich Shops" has the potential of being an excellent simulation provided the teacher is prepared to do the necessary initial preparation and to guide the classroom discussion in accordance with the given suggestions. Since reports are generated on the computer by the teacher outside of class time, it is ideally suited for situations where computer access is limited. "Enterprise Sandwich Shops" can make the study of business interesting for students by providing a practical business simulation that encourages students to become actively involved in developing an understanding of business enterpreneurship, marketing, retailing and management.

APPLE - IBM VERSIONS

This report was based on an evaluation of the Apple version of this product, however, in reviewing the IBM version, no significant differences were found. The screen displays for data entry are somewhat clearer on the IBM version in that they utilize bold face type for emphasis and they do not use abbreviations but the printouts generated are virtually identical in both versions.

STATUS

The Apple and IBM versions of "Enterprise Sandwich Shops" have been designated as **RECOMMENDED** learning resources for Basic Business 20/30 and Marketing 20/30.

PURCHASE INFORMATION

Alberta schools may purchase the product from the School Book Branch for approximately $180 (1985). Defective diskettes will be replaced without charge within a 30 day warranty period. No further warranty is available.

As disk access is frequent, this product may be used on only one machine at a time.

EQUATIONS II

DESCRIPTION

Title: Equations II
Author(s): Mark Appel & Don Ross
Publisher: Microcomputer Workshops
Source: c/o CBS Interactive Learning, One Fawcett Place, Greenwich, CT 06836
Subject: Mathematics
Topics: Solving equations with variables on both sides of the equal sign
Components: 1 disk, backup, teacher's guide (9p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monochrome monitor
IBM PC, 64K, monochrome monitor
Other Formats Available (not evaluated): TRS-80, Commodore 64

Version: 1984
Display Language: English
Cost: $29.95 U.S. (1985)
Tel. #: (203) 622-2500
Users: Grades 8 - 11

OBJECTIVES

This program is designed to give students practice in solving equations with a variable on both sides of the equation using the axioms of addition, subtraction, multiplication and division.

PEDAGOGICAL CONTENT DESCRIPTION

This program covers solving linear equations in the form of "Ax + B = Cx + D" where A, B, C and D are integers and A, C are not equal to zero.

An introduction includes an explanation of 5 procedural rules, the procedure used if a mistake is made, two types of errors and a sample problem. To solve an equation, the user chooses one of the five rules which allow the student to add, subtract, multiply, divide or simplify both sides. After the rule is chosen, the program then steps the user through the process. The user can choose to complete between 1 and 50 exercises.

PEDAGOGICAL CONTENT EVALUATION

The range and sequence, while limited, are appropriate to the target audience and to the intents of the program, i.e. to teach a procedure which can be applied to more difficult problems. As such, there is no development from easy to difficult as the object is to provide practice in following a structured approach. The depth is somewhat lacking in that definitions and explanations are not accessible when required, but sufficient practice is provided. The students will likely require some assistance from the teacher to supplement the introduction to the program. The program does not allow students an extra step even though that step would lead to the correct solution.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of menu selection, page turning, and numeric inputs. The student uses "Y" or "N" in branching, "RETURN" for page turning, and "R" for paging backwards. The drill questions require the user to select the proper step from a menu and input the simplified forms of the equations.

The questions are randomly generated and the user may choose from 1 to 50 problems.

All feedback is textual. Correct responses to each step result in the program proceeding through the solution process until the correct answer is obtained. Positive feedback is provided only at the end of a correct problem. If an incorrect answer is given, the student is given another chance to respond. If the second response is wrong, the correct answer with a brief explanation is given and the student must input the answer. Quantitative feedback giving procedural and computational errors is provided at the end of each problem and also at the end of a drill. This information can be printed.

INSTRUCTIONAL FORMAT EVALUATION

Student interaction is appropriate in that the student is actively involved throughout the program. The interaction is consistent with the student working through a very structured problem solving approach. Student solutions involving extra steps will not be accepted. The repetitious patterns of the interaction are appropriate for students who may be having difficulties; proficient students would find them tedious as they do not need this level of help.

The questions are appropriate and effectively randomized, but they are not sequenced from easy to hard.

The feedback is appropriate. The explanations which are given with incorrect responses are effective. The quantitative feedback including procedural and computational errors can be printed for teacher use.

The lack of an evaluation component is a weakness, but the summation of errors can perhaps be helpful in this regard.

TECHNICAL CHARACTERISTICS DESCRIPTION

Text and numbers are in standard size print with upper and lower case letters. Inverse text is used for highlighting and the student can reread pages in the explanation. Graphics, sound and color are not used in this program.

TECHNICAL CHARACTERISTICS EVALUATION

The displays are appropriate and easy to read. The inverse print used in highlighting is effective in attracting the user's attention.

The program is easy to use and appears to be reliable under normal use. Generally, the technical design is satisfactory.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

Although the documentation does not identify any specific entry compentencies, students need to know how to add like terms, have knowledge of the basic operations with integers and be able to solve simple equations before using this program. The teacher should explain the five rules to be used and a solution path that involves an extra step.

No management system is provided in this program.

The teacher documentation includes the objectives, suggested grade levels, program description, a sample problem and its solution.

No user support materials are provided.

IMPLEMENTATIONAL SUPPORT EVALUATION

The specific entry competencies noted above are required and appear to be appropriate for the target audience.

The lack of a management system and the absence of user support materials are disadvantages.

The program is easy to use for the student and teacher. Minimal teacher introduction and supervision are required. The program can be used by individuals, small groups, and may even be suitable for a whole class demonstration.

SUMMATION

This disk uses the computer's abilities to provide step-by-step guided instruction in the problem solving process of solving equations. The strengths of the program are its structured presentation, its good error trapping and the level of student interaction that is required. However, the lack of sequence from easy to difficult and the structured progression through the algorithm limits the program somewhat. It would be most appropriate for remediation where the student has had some introduction to the concepts and needs the structured assistance this program can deliver.

APPLE - IBM VERSIONS

This report is based on the evaluation of the Apple product. In reviewing the IBM version, it was found that the IBM version did not differ in any substantial fashion.

STATUS

The Apple and IBM versions of "Equations II" have been authorized as **SUPPLEMENTARY** learning resources for grades 8-11.

PURCHASE INFORMATION

This product may be purchased for $29.95 U.S. (1985) from CBS Interactive Learning at the address given at the beginning of the report. Lab packs are available in the following quantities and prices: 10 copies @ 3 x list price; 15 copies @ 4 x list price; 20 copies @ 5 x list price; 25 copies @ 6 x list price. The company provides a life time guarantee against defective diskettes and will replace worn out diskettes without charge at any time.

This diskette has the advantage of being capable of operation with more than one machine at a time; however, such use is subject to copyright laws and any license or purchase agreement.

ESTIMATION

DESCRIPTION

Title: Estimation
Series: Micros for Micros
Author(s): Tim Aaronson et al
Publisher: Lawrence Hall of Science, Math & Computer Education Project
Source: University of California, Berkeley, CA 94720
Subjects: Mathematics, Early Childhood
Topics: Estimating distance, speed, quantity & length
Components: 1 disk, teacher's guide (20p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, color monitor preferred
Other Formats Available (not evaluated): Available in Apple format only
Alberta Education Call No.: QA 276.8 E81 1983

Version: 1983
Display Language: English
Cost: $34.95 US (1985)
Tel. #: (415) 642-3167
Users: Grade 1

OBJECTIVES

This program will provide students with practice in estimating length, quantity, rate and size.

PEDAGOGICAL CONTENT DESCRIPTION

This disk contains three programs designed to provide estimation practice:

CHOO CHOO - allows the student to control the variables of sound, speed and visibility as (s)he estimates the whereabouts of a train in a tunnel. The user must stop the train over a predetermined spot.

JUNK JAR - The user selects one of seven objects of varying colors, shapes and sizes. The student must then estimate the number of objects (1-50) that will fit in a jar (randomly selected by the computer).

BUG TRACKS - This program contains three menu options:

a) Guess How Long - The user estimates the number of bugs that can fit on a line.
b) Which is Longer - A bug leaves two trails and the user must decide which trail is longer.
c) Match my Line - The user tries to draw a horizontal line equal in length to a given vertical or diagonal one.

PEDAGOGICAL CONTENT EVALUATION

The content range may be beyond the abilities of some of the target audience. For example, "Choo Choo" deals with the concept of estimating the rate of travel which involves estimation of both distance and time. Estimating them conjunctively may be beyond the abilities of the user. Similarly as the estimations of volumes involve up to 50 items, some users may not be familiar with large numbers, let alone be able to form abstract conceptualizations of them. Likewise comparing line lengths might be an acceptable activity if the lines were straight, however the introduction of angles and curves could be beyond the ability of much of the target audience.

Four of the five programs have no evident sequencing, thus there is no gradual build-up from easy to difficult or from concrete to abstract. Content mastery would undoubtedly improve if careful sequencing was employed and if content depth was enhanced by providing users with strategies for estimation.

It should be noted that the program is intended to be used with an adult present. As such, some of the weaknesses noted above can be minimized by teacher instruction. However, to be effective, one-on-one attention may be required for some students and this would likely be prohibitive for classroom use.

While analysts had some serious concerns about the applicability of the content treatment, most of the weaknesses focussed on the potential use of the program by preschool students. Some of the students in this target audience could use the program to advantage. However, it was felt that the program would be more appropriate for grade 1 students as most of the weaknesses cited above would not apply.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of menu selection, entering answers via the number keys and a few alphabetic keys, and using the escape, return, or space bar to advance frames. The "questions" (i.e. the lines draw by the bug, the stopping spot for the train in "Choo Choo", the size of the jar in "Junk Jar", etc.) are all randomly generated. Feedback combines graphics, sound and text. (E.g. If the user is successful in stopping the train at the predetermined spot, it toots its whistle and lets out a burst of steam; if the user selects the correct number of bugs to fit a line they are displayed on the line together with the message "You are correct", etc.) Incorrect answers are often given pictorial and textual clues. (E.g. A low estimate of the number of objects needed to fill a jar results in the objects being counted as they are pictorially placed into the jar.) The program does not incorporate evaluation at the end of each program. The user initially selects sequence from menu, however once into a program, sequence is computer controlled. Rate and amount are student controlled.

INSTRUCTIONAL FORMAT EVALUATION

While the student input is effectively limited to pressing one of seven keys, the written instructions require that an adult read and teach the youngster how to use the program. Moreover, although the object of this program is to develop estimation skills, at no point in the program is the student allowed to experiment with any strategies for determining an estimate. The instructional strength of the program would be vastly improved if users were allowed to manipulate the objects and work out their estimates on the screen.

The feedback lacks variety and may become repetitive and uninteresting in short order. Textual comments such as "The jar would burst" are beyond the reading ability of the target audience. For the most part, the feedback fails to explain, correct, or reinforce processes or answers. The process of presenting feedback is also inconsistent. For example, in "Guess How Long" the computer will measure out bugs along the line only if the estimates are too short or if they are correct. No attempt is made to illustrate why a high estimate is incorrect.

TECHNICAL CHARACTERISTICS DESCRIPTION

Operating instructions are written in standard size uppercase text; direct questions that require a user input are written in large, bold, uppercase text. Animated, colored high resolution graphics are used throughout the program and sound, which can be disabled, is used to provide motivational effects.

TECHNICAL CHARACTERISTICS EVALUATION

Misconceptions and errors may occur due to inaccurate technical presentation of units of measurement. For example, students are asked how many bugs will fit on a given line and are shown a bug at the bottom of the screen. When the answer is displayed with the bugs actually fitted to the line, they are an entirely different size from the initial one depicted.

The use of graphics, animation, color and sound adds much to the programs.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

The 20 page teacher's guide contain objectives, computer operation instructions, program descriptions, and includes four suggestions for student activities which are designed to supplement the disk activities.

IMPLEMENTATIONAL SUPPORT EVALUATION

The teacher's guide provides basic instructions and descriptions of the program's contents. The student support materials are clearly written, however, like the disk itself, they involve skills which are likely beyond the cognitive development of the target audience.

SUMMATION

The activities presented on the disk are imaginative and could prove motivational and instructional if used with a grade 1 target audience, particularly if adult intervention was possible.

STATUS

"Estimation" has been designated as a **SUPPLEMENTARY** learning resource for Grade 1.

PURCHASE INFORMATION

This product may be purchased for $34.95 U.S. (1985) from Lawrence Hall of Science at the address given at the beginning of the report. A back-up diskette may also be purchased at that time for $12.95.

Warranty information was not available at time of printing.

The disk is accessed at the beginning of each menu activity. As such, the disk has the advantage of being capable of operation with more than one machine at a time provided that the user plays only one game; however, such use is subject to copyright laws and any license or purchase agreement.

EXPLORING TABLES & GRAPHS LEVEL 1

DESCRIPTION

Title: Exploring Tables & Graphs Level 1
Author: Stephen Bannasch
Publisher: Field Publications
Source: 245 Long Hill Road, Middletown, CT 06457
Subject: Mathematics
Topics: Exploring and creating tables & graphs (bar, area & picture graphs
Components: 1 doublesided disk, user's guide (32p.), practice master sheets (12)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, color monitor, printer
Other Formats Available (not evaluated): Available only in Apple format

Version: 1984
Display Language: English
Cost: $34.95 US (1986)
Tel. #: (203) 638-2400
Users: Grades 3 & 4

OBJECTIVES

It is inferred that this program is designed to help students learn to:

1. Organize data on a table
2. Understand how symbols are used in picture graphs
3. Understand the purpose of a key
4. Construct a simple bar graph
5. Interpret a multicolumn table
6. Understand the meaning of the fractional parts of symbols on a picture graph
7. Read bar graphs using various intervals
8. Construct an area graph.

PEDAGOGICAL CONTENT DESCRIPTION

This program provides students with opportunities to construct and interpret tables, bar graphs, picture graphs, and area (circle) graphs.

One side of the disk provides instruction on the four topics. Within each of these, students may elect to see a brief explanation, play a game, or see an example. The explanation (e.g. "All About Tables") consists of a brief overview of that type of table/graph. The games are used to generate data which are initially displayed in tabular form and, if the student is exploring a graph, are then subsequently converted to that graph type. Questions regarding graph interpretation are then posed for student response.

The example sub-selection makes graphs of interesting statistics such as yards gained by football players, largest pies, longest rivers, fastest animals, how you spend you day, weather records, etc. Questions designed to test student understanding of the graph are posed after each example.

The second side of the disk allows the user to become an active participant in the creation of tables and/or graphs. This is done in either of two ways. The user may elect to start with data that is already entered on the program disk (the examples provided previously). (S)he may then change the information or the manner in which it is displayed. Alternatively, the user may create his/her own tables and graphs. In either case, the user may save the new product on a data disk and/or print the table. If an appropriate interface card is available, the graphs may also be printed.

PEDAGOGICAL CONTENT EVALUATION

Content range is appropriate - the introduction of tables, picture graphs, bar graphs and area (circle) graphs is appropriate for this target audience. Within the graphs, no sequence is required and the student may elect to study any form of graph desired. As all the graphs draw upon the student's understanding of a table, the program should make it clear that this should be studied first.

Depth is weakened somewhat by the poor explanation in the "All About ..." sections. These provide only a cursory explanation which has neither appropriate clarity or length. Clarity and depth are much better in the game and example sections. Ample and interesting examples are available and the games provide an interesting method of gathering statistics. These sections do still suffer from somewhat weak depth however as insufficient questions are posed and most involve low level questioning techniques only. At the end of the examples, higher level questions are posed but not answered.

The content weaknesses noted above can be easily overcome with teacher control of the learning activities and through use of the "create your own" features on the other side of the disk. Students will likely be highly motivated by the ability to create their own tables and graphs, change the colors, sizes and other parameters and print out their creations. This part of the package is a powerful tool which the teacher may use either for demonstration, lab or self exploration activities.

Unfortunately the content is not metricated--imperial length and weight measurements are used throughout the program. Also, the program should make it clear that at least two games should be played in order to generate sufficient data for the tables. If only one is played, the user is told that more data is needed. Unfortunately, (s)he is not told that the results from his/her first game will not be kept and a minimum of two games must be played at one time. Similarly, data from the games played for one table/graph are not kept when a second type is explored. It would be appropriate for cumulative data to be kept and applied where the same games are used.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of using the J, K, I, and M keys for cursor movement and using numeric or alphabetic keys for answer input. Questions are posed in a fixed sequence at the end of each table/graph production. Students are given unlimited attempts at each question--negative responses receive the comment "Not that one, try again"; positive responses receive a textual comment such as "You've got it!", "Terrific", or "Right". All responses are accompanied by sound.

INSTRUCTIONAL FORMAT EVALUATION

Questions are straight forward and feedback is immediate and non-threatening. Prompting and cueing techniques are not used; rather students are given unlimited attempts at a question until the correct answer is obtained, consequently the positive feedback may be inappropriate at times (e.g. "Terrific" in response to a correct answer after five incorrect attempts). While most answers are obvious, it is unfortunate that corrective feedback is not available for the few questions that require higher level skills. It is also unfortunate that no form of quantitative feedback is available.

The disk instructions provided for side two of the disk (i.e. "Make Your Own") are extremely limited--most students will require teacher assistance for initial operation.

TECHNICAL CHARACTERISTICS DESCRIPTION

Color, sound, and graphics are used throughout the program. A management system is not offered.

TECHNICAL CHARACTERISTICS EVALUATION

Displays are attractive and effective. A color monitor is essential for at least one of the games and its use certainly enhances interest in the other game and the "Create Your Own" activities. Unfortunately sound cannot be disabled.

While side one of the disk is easy to use, students will require some assistance when using side two of the disk to formulate and print their own graphs. It should be noted that obtaining a hard copy of graphs requires a printer equipped with an interface card capable of printing high resolution graphics.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

The user's guide provides disk operation instructions, suggests activities for students to engage in to collect data for use in preparing tables and graphs, and includes twelve worksheets which provide practice in construction and interpretation.

IMPLEMENTATIONAL SUPPORT EVALUATION

The documentation is designed to cover both parts of this series and therefore is written in general terms. While it includes all information necessary for disk operation, it does not explicitly state program objectives, expected pre-requisite knowledge, etc. In addition, although the documentation has obviously been intended for student use, a reading level beyond grade 3 and 4 students, poor clarity and weak organization would restrict its appropriateness to teacher use only. Even for teachers, the section which explains the operation of the "Make Your Own" features would be difficult to follow. Clarity could be substantially improved by including distinct chapters paralleling each disk topic and including sub-units on each program function.

The student support materials provide appropriate supplementary practice on the concepts covered on the disk.

SUMMATION

The explanatory portion of the program is reasonably good as it arouses student interest by using games to collect data and it provides interesting examples which will give students necessary background information on tables and graphs. The strength of the package however is in the "Create Your Own" side where students can put this knowledge to work. This portion of the disk can be an effective tool if used within a teacher-designed series of activities.

The program's chief weaknesses are its lack of metrication, its lack of corrective feedback, the inability to disable sound and the poor clarity in the documentation.

Teachers should note that there are two levels in this series. Level 2 includes different examples and different games, as well as content on line graphs; however, it is very similar to Level 1. As such, the value of purchasing both level 1 and level 2 is questionable. Presumably, the authors intended the content in level 1 to be presented in a fashion that is more appropriate to younger students and this may be the case. However, the design of the two packages is very similar and prospective purchasers should examine both carefully to determine if both are indeed needed.

STATUS

"Exploring Tables & Graphs Level 1" has been authorized as a SUPPLEMENTARY learning resource for grades 3 - 4.

PURCHASE INFORMATION

This product may be purchased for $34.95 U.S. (1986) from Field Publications at the address given at the beginning of the report. Defective diskettes will be replaced free of charge within a 90 day warranty period. Thereafter, damaged diskettes may be replaced for $10.00. Backup diskettes may be purchased for $10.00 and a lab pack, consisting of five disks and one guide, is available for $75.00 U.S.

Due to frequent disk interaction, this diskette may be used on only one machine at a time.

EXPLORING TABLES & GRAPHS LEVEL 2

DESCRIPTION

Title: Exploring Tables & Graphs Level 2
Author: Stephen Bannasch
Publisher: Field Publications
Source: 245 Long Hill Road, Middletown, CT 06457
Subject: Mathematics
Topics: Exploring and creating tables & graphs (bar, line, area & picture graphs
Components: 1 doublesided disk, user's guide (32p.), practice master sheets (12)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, color monitor preferred, printer
Other Formats Available (not evaluated): Available only in Apple format

Version: 1984
Display Language: English
Cost: $34.95 US (1986)
Tel. #: (203) 638-2400
Users: Grades 5 & 6

OBJECTIVES

It is inferred that this program is designed to help students learn to:

1. Organize data on a table
2. Understand how symbols are used in picture graphs
3. Understand the purpose of a key
4. Construct a simple bar graph
5. Interpret a multicolumn table
6. Understand the meaning of the fractional parts of symbols on a picture graph
7. Read bar graphs using various intervals
8. Construct an area graph
9. Read multiline graphs and interpret data

PEDAGOGICAL CONTENT DESCRIPTION

This program provides students with opportunities to construct and interpret tables, bar graphs, picture graphs, line graphs and area (circle) graphs.

One side of the disk provides instruction on the five topics. Within each of these, students may elect to see a brief explanation, play a game, or see an example. The explanation (e.g. "All About Tables") consists of a brief overview of that type of table/graph. The games are used to generate data which are initially displayed in tabular form and, if the student is exploring a graph, are then subsequently converted to that graph type. Questions regarding graph interpretation are then posed for student response.

The example sub-selection makes graphs of interesting statistics such as batting averages, insect metamorphosis, world population, world grain production, etc. Questions designed to test student understanding of the graph are posed after each example.

The second side of the disk allows the user to become an active participant in the creation of tables and/or graphs. This is done in either of two ways. The user may elect to start with data that is already entered on the program disk (the examples provided previously). (S)he may then change the information or the manner in which it is displayed. Alternatively, the user may create his/her own tables and graphs. In either case, the user may save the new product on a data disk and/or print the table. If an appropriate interface card is available, the graphs may also be printed.

PEDAGOGICAL CONTENT EVALUATION

Content range is appropriate - the introduction of tables, picture graphs, bar graphs, line graphs and area (circle) graphs is appropriate for this target audience. It should be noted that the program does not cover reading and writing coordinates, graphing ordered pairs or locating points in all four quadrants. Within the graphs, no sequence is required and the student may elect to study any form of graph desired. As all the graphs draw upon the student's understanding of a table, the program should make it clear that this should be studied first.

Depth is weakened somewhat by the poor explanation in the "All About ..." sections. These provide only a cursory explanation which has neither appropriate clarity or length. Clarity and depth are much better in the game and example sections. Ample and interesting examples are available and the games provide an interesting method of gathering statistics. These sections do still suffer from somewhat weak depth however as insufficient questions are posed and most involve low level questioning techniques only. At the end of the examples, higher level questions are posed but not answered.

The content weaknesses noted above can be easily overcome with teacher control of the learning activities and through use of the "create your own" features on the other side of the disk. Students will likely be highly motivated by the ability to create their own tables and graphs, change the colors, sizes and other parameters and print out their creations. This part of the package is a powerful tool which the teacher may use either for demonstration, lab or self exploration activities.

Unfortunately the content is not metricated--imperial length and weight measurements are used throughout the program. Also, the program should make it clear that at least two games should be played in order to generate sufficient data for the tables. If only one is played, the user is told that more data is needed. Unfortunately, (s)he is not told that the results from his/her first game will not be kept and a minimum of two games must be played at one time. Similarly, data from the games played for one table/graph are not kept when a second type is explored. It would be appropriate for cumulative data to be kept and applied where the same games are used.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of using the J, K, I, and M keys for cursor movement and using numeric or alphabetic keys for answer input. Questions are posed in a fixed sequence at the end of each table/graph production. Students are given unlimited attempts at each question--negative responses receive the comment "Not that one, try again"; positive responses receive a textual comment such as "You've got it!", "Terrific", or "Right". All responses are accompanied by sound.

INSTRUCTIONAL FORMAT EVALUATION

Questions are straight forward and feedback is immediate and non-threatening. Prompting and cueing techniques are not used; rather students are given unlimited attempts at a question until the correct answer is obtained, consequently the positive feedback may be inappropriate at times (e.g. "Terrific" in response to a correct answer after five incorrect attempts). While most answers are obvious, it is unfortunate that corrective feedback is not available for the few questions that require higher level skills. It is also unfortunate that no form of quantitative feedback is available.

The disk instructions provided for side two of the disk (i.e. "Make Your Own") are extremely limited--most students will require teacher assistance for initial operation.

TECHNICAL CHARACTERISTICS DESCRIPTION

Color, sound, and graphics are used throughout the program. A management system is not offered.

TECHNICAL CHARACTERISTICS EVALUATION

Displays are attractive and effective. A color monitor is not essential but would certainly enhance interest in the games and the "Create Your Own" activities. Unfortunately sound cannot be disabled.

One technical error was noted in the unit on line graphs - "... line graph is good for showing showing a trend.....".

While side one of the disk is easy to use, students will require some assistance when using side two of the disk to formulate and print their own graphs. It should be noted that obtaining a hard copy of graphs requires a printer equipped with an interface card capable of printing high resolution graphics.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

The user's guide provides disk operation instructions, suggests activities for students to engage in to collect data for use in preparing tables and graphs, and includes twelve worksheets which provide practice in construction and interpretation.

IMPLEMENTATIONAL SUPPORT EVALUATION

The documentation is designed to cover both parts of this series and therefore is written in general terms. While it includes all information necessary for disk operation, it does not explicitly state program objectives, expected pre-requisite knowledge, etc. In addition, although the documentation has obviously been intended for student use, poor clarity and weak organization would restrict its appropriateness to teacher use only. Even for teachers, the section which explains the operation of the "Make Your Own" features would be difficult to follow. Clarity could be substantially improved by including distinct chapters paralleling each disk topic and including sub-units on each program function.

The student support materials provide appropriate supplementary practice on the concepts covered on the disk.

SUMMATION

The explanatory portion of the program is reasonably good as it arouses student interest by using games to collect data and it provides interesting examples which will give students necessary background information on tables and graphs. The strength of the package however is in the "Create Your Own" side where students can put this knowledge to work. This portion of the disk can be an effective tool if used within a teacher-designed series of activities.

The program's chief weaknesses are its lack of metrication, its lack of corrective feedback, the inability to disable sound and the poor clarity in the documentation.

While Level 2 in this series does include different examples and different games, as well as content on line graphs, it is very similar to Level 1. As such, the value of purchasing both level 1 and level 2 is questionable. Presumably, the authors intended the content in level 1 to be presented in a fashion that is more appropriate to younger students and this may be the case. However, the design of the two packages is very similar and prospective purchasers should examine both carefully to determine if both are indeed needed.

STATUS

"Exploring Tables & Graphs Level 2" has been authorized as a **SUPPLEMENTARY** learning resource for grades 5 - 6.

PURCHASE INFORMATION

This product may be purchased for $34.95 U.S. (1986) from Field Publications at the address given at the beginning of the report. Defective diskettes will be replaced free of charge within a 90 day warranty period. Thereafter, damaged diskettes may be replaced for $10.00. Backup diskettes may be purchased for $10.00 and a lab pack, consisting of five disks and one guide, is available for $75.00 U.S.

Due to frequent disk interaction, this diskette may be used on only one machine at a time.

FACTORING ALGEBRAIC EXPRESSIONS

DESCRIPTION

Title: Factoring Algebraic Expressions
Author: Mark Berman, Kevin Vessio & Don Ross
Publisher: Microcomputer Workshops
Source: c/o CBS Interactive Learning, One Fawcett Place, Greenwich, CT 06836
Subject: Mathematics
Topics: Quadratic trinomials, difference of two squares, common factor, mixed problems
Components: 1 diskette, backup, guide (2p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monochrome monitor
IBM PC, 64K, monitor
Other Formats Available (not evaluated): Commodore 64, TRS 80
Alberta Education Call No.: QA 157 F142 1984

Version: 1984
Display Language: English
Cost: $29.95 U.S. (1985)
Tel. #: (203) 622-2500
Users : Grade 10

OBJECTIVES

This package is designed to provide students with:

1. Practice in factoring algebraic linear and quadratic expressions.
2. An understanding of the factoring process by simulating the procedure used in the classroom.

PEDAGOGICAL CONTENT DESCRIPTION

Four types of factoring problems are covered in this program:

1. Quadratic trinomials with an x coefficient of 1
2. Quadratic trinomials with an x coefficient of 2, 3, or 4
3. Difference of two squares of the form a x -b where a is 1, 2, or 3 and 1< b <10
4. Common factors of quadratic and linear binomials in x.

In addition a fifth program presents a mixture of the above four problem types.

The program includes a brief explanation of the procedures for solving the problems along with provision for help in solving the problem and/or for seeing the solution. The user selects the number of questions to be done (1-9) and an error analysis is given after each individual problem attempt.

PEDAGOGICAL CONTENT EVALUATION

The range and sequence are most appropriate for the younger portion of the target audience although the program would be appropriate for review for older students. Content in the "Common Factor" and "Difference of Two Squares" programs is restrictive and could be improved by the addition of other variables and the inclusion of a wider variety of numerical coefficients. Depth is generally insufficient in all programs due to insufficient instruction and example problems. A well-designed help avenue which allows the user to see what the results of expansion will be as (s)he changes the components of the factors does partially compensate for this however. In general the provision for practicing any one type of problem or all four types at once and the ability to get limited assistance are strengths of the program.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of using the RETURN, arrow, "+", "-" and number keys. "H" and "S" keys are used for tutorial instruction. Questions are randomly generated within the parameters described in the documentation. Feedback is provided after each answer, and an error analysis follows each problem attempt. Errors are described by comparing the expanded polynomial of the user factor to the polynomial under consideration and diagnosing where the differences were generated. When the problem is corrected, a summary of errors for all attempts at the problem is given which includes:

1. Format of the factors
2. Finding the common factor
3. Difference of two squares
4. Leading coefficient
5. Sign of the constant term
6. The constant term
7. The linear term.

INSTRUCTIONAL FORMAT EVALUATION

Questions are randomly generated from a limited test bank and are representative of sample questions outlined for each program in the user's guide. Sequencing within a menu choice is program controlled; however, the user has appropriate control over rate and amount (to a maximum of 9 questions/set). Immediate feedback is provided and messages generally have appropriate degrees of commiseration and encouragement. The help and solution branches are effective in accommodating ability differences among users and are major strengths of the program.

The error display summaries which appear after each problem may be of questionable interest to the user; however, they would be useful for the teacher.

TECHNICAL CHARACTERISTICS DESCRIPTION

The screen is consistently divided into three areas: the questions is posed at the top, the middle area is used for work space, and the bottom is reserved for messages, correction cues and key use reminders. All text is presented in standard size, upper case formation. Neither graphics nor color are used.

TECHNICAL CHARACTERISTICS EVALUATION

This program is easy to use and is bombproof. The design is appropriate and clear in most cases, although the message area at times gets crowded. Error trapping is generally good, although an answer such as (-x-2)(-x-1) in the place of (x+2)(x+1) is not permitted. The use of a combination of upper/lower case text might be more appropriate for the designated audience.

SUMMATION

The strengths of this program (good content sequence, a well-designed help avenue, clearly formatted question screens, and reasonable price) outweigh the weaknesses mentioned earlier.

APPLE - IBM VERSIONS

This report is based on the evaluation of the Apple product. However, in reviewing the IBM version, no notable differences were found.

STATUS

The Apple and IBM versions of "Factoring Algebraic Expressions" have been designated as **SUPPLEMENTARY** learning resources for Grade 10 students (Math 10/13).

PURCHASE INFORMATION

This product may be purchased for $29.95 U.S. (1985) from CBS Interactive Learning at the address given at the beginning of the report. Lab packs are available in the following quantities and prices: 10 copies @ 3 x list price; 15 copies @ 4 x list price; 20 copies @ 5 x list price; 25 copies @ 6 x list price. The company provides a life time guarantee against defective diskettes and will replace worn out diskettes without charge at any time.

The disk has the advantage of being capable of operation with more than one machine; however, such use is subject to copyright laws and any license or purchase agreement.

THE FACTORY

DESCRIPTION

Title: The Factory
Authors: Marge Kosel, Mike Fish
Publisher: Sunburst Communications
Source: 39 Washington Avenue, Pleasantville, NY 10570
Subject: Problem Solving, Math
Topics: Understanding sequence, logic & efficiency, inductive thinking, spatial perception
Components: 1 disk with back-up, teacher's guide (11p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, color monitor (preferred)
Other Formats Available (not evaluated): Atari; Commodore 64; IBM PC family; Tandy 1000, TRS-80 Color Computer

Version: 1983
Display Language: English
Cost: $59.00 US (1985)
Tel. #: (914) 769-5030
Users: Grades 4 - 9

OBJECTIVES

This disk is designed to provide students with experiences which will help them to:

1. Develop visual discrimination and spatial perception skills.
2. Understand the importance of sequence and order.
3. Use the cognitive strategy of working backwards.
4. Understand that there may be more than one solution to a problem.

PEDAGOGICAL CONTENT DESCRIPTION

This program promotes the skill of problem solving using the concepts of sequence, rotation, visual discrimination, spatial perception and logic. Students are presented with three different machines that can rotate, punch holes and draw stripes on a square. There are three levels of difficulty:

1. Test a Machine - allows students to experiment with the three machines.
2. Build a Factory - allows students to design his/her own product using one to eight machines.
3. Make a Product - permits a student to examine a product and then work backwards to determine what process took place to construct the product.

PEDAGOGICAL CONTENT EVALUATION

The pedagogical content is appropriate for the target audience and offers just enough challenge to keep a student interested but not frustrated. Excellent sequencing allows students to first learn the use of machines through simple manipulations and then move on to more challenging ones. Good depth is available. The topics used for problem solving are current and the skills developed are applicable to many areas of the curriculum.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of selecting a program from the menu and choosing the level of difficulty. Designs are created via the arrow keys and the RETURN key. Problems presented by the program are categorized as easy, medium and hard and are randomized within each section. The program accepts a variety of formats. If an incorrect solution is derived, the program tells the student that his/her product has a flaw and asks if (s)he would like to try again. Correct solutions result in the message "You made the product correctly". There is no summative feedback provided.

Sequence, rate and amount are controlled by the user.

INSTRUCTIONAL FORMAT EVALUATION

Ample opportunity for student interaction is provided and the method of interaction is simple and consistent. While the program does allow for the correction of incorrect entries, this process could be better explained on the screen. Inputs are accepted at an appropriate rate, however the graphic generation which shows how each machine changes the product tends to be a bit slow. Feedback is appropriate, and permitting numerous attempts at arriving at a solution is effective for this type of problem solving. The fact that students have total control of rate, sequence and amount makes it suitable for a variety of learning abilities. (Young students should be encouraged to tackle the programs in consecutive order as the concepts presented in earlier programs provide essential stepping-stones for successive programs).

TECHNICAL CHARACTERISTICS DESCRIPTION

Large size combination upper/lower case lettering is used. Graphics are accompanied by sound.

TECHNICAL CHARACTERISTICS EVALUATION

Screen displays are effectively formatted and sound employed mimics the operation the machine is carrying out.

IMPLEMENTATIONAL SUPPORT: DESCRIPTION

The eleven page teacher's guide offers instructional objectives, strategies for classroom implementation, a description of disk contents and program operating instructions. It also includes a readability level, examples and a suggested program sequence.

A one-page reproducible student handout is available for students to keep a written record of how their product was constructed.

IMPLEMENTATIONAL SUPPORT: EVALUATION

The teacher's guide is well-organized and easy to use. The student handout is effective in the areas of developing a strategy or design before it is entered, however it is not essential to program operation.

The disk can be used by a student with a minimum of computer competency. Little teacher supervision should be required as the disk is self-explanatory.

SUMMARY STATEMENT

This program is very motivating, easy to use and is reliable in normal classroom applications. It encourages students to approach problem solving from many different perspectives.

STATUS

"The Factory" has been authorized as a **SUPPLEMENTARY** learning resource for Mathematics and Problem Solving Grades 4-9.

PURCHASE INFORMATION

This product may be purchased for $59.00 U.S. (1985) from Sunburst Communications at the address given at the beginning of the report. A lab pack, consisting of 10 diskettes and one set of teacher documentation is available for $177. U.S. (1985). Sunburst Communications offers a lifetime warranty on their courseware products and will replace defective diskettes at no charge.

This disk has the advantage of being capable of operation on more than one computer at a time; however, such use is subject to copyright laws and any license or purchase agreement.

FAST FACTS

DESCRIPTION

Title: Fast Facts
Authors: Steketee Educational Software
Publisher: EduSoft
Source: P. O. Box 2560, Berkeley, California, 94702
Subject: Mathematics
Topics: whole number facts
Components: 1 disk, guide (2p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monochrome monitor
Other Formats Available (not evaluated): TRS 80, Atari
Alberta Education Call No.: QA 115 F251 1983

Version: 1983
Display Language: English
Cost: $34.95 U.S. (1985)
Tel. #: (415) 548-2304
Users : Grades 1-6

OBJECTIVES

To provide timed drills on whole number facts.

PEDAGOGICAL CONTENT DESCRIPTION

There are five programs on the disk. Each program allows the user to select the operation that is to be practiced (addition, subtraction, multiplication and division). Most of the programs also allow the user to be drilled on an assortment of operations. During the drill, the user (or the users) answer a minimum of 10 questions, each within 10 seconds. Scores are based on accuracy and speed. If the user elects to play the game again, (s)he is encouraged to beat her/his previous high score.

The five programs are:

1. Beginner Fast Facts - practice at a slow pace
2. Solo Fast Facts - 10 questions @ 10 seconds per question
3. Team Fast Facts - a team of 2 to 5 members play the game
4. Competition Fast Facts - students play against a competitor
5. Marathon Fast Facts - 100 different number facts with a 10 second time limit.

PEDAGOGICAL CONTENT EVALUATION

Content range, sequence and depth are all appropriate. The ability to choose any one of the operations, or a combination of operations, makes this disk appropriate at a number of grade levels.

INSTRUCTIONAL FORMAT DESCRIPTION

Students enter numerical answers and the computer evaluates each digit upon entry. The user also chooses from the menu page, elects to play again and has the opportunity of repeating questions which were wrong.

Feedback consists of both sound and aural messages presented after one attempt. If the answer is correct, the student sees the word "yes" and hears a short beep. If the answer is wrong, a buzz is heard and the correct answer is then presented along with another tone signal. Sound is optional and may be turned off at the menu. Quantitative feedback is given at the end of the drill and the user is encouraged to beat the score. In some games, a "half time" score is also given.

Questions are randomized. If an error is made, the student will be given the choice of increasing his/her score by attempting those questions again.

INSTRUCTIONAL FORMAT EVALUATION

The user is given only one attempt at a question and thus may be penalized for typing errors. (2 digit answers will be counted wrong immediately if the first digit is incorrect.) As this is intended as a speed drill, this feature is not particularly damaging.

It may have been advantageous to allow the user or the teacher some control over the time limit.

The instructional format is generally good within the restrictions of the speed drill format. The re-presentation of errors makes this disk a "cut above" the other speed drills.

TECHNICAL CHARACTERISTICS DESCRIPTION

Text and numbers are presented in large size print. As indicated earlier, sound is optional.

TECHNICAL CHARACTERISTICS EVALUATION

The time limit in "Solo Fast Facts" is approximately 5 seconds and not 10 as described. Also, it may have been a good idea to include an escape feature, particularly in the last program. Generally speaking however, the technical design is good.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

A two page brochure accompanying the product provides a brief introduction to the program (objectives, system requirements, use of the program).

IMPLEMENTATIONAL SUPPORT EVALUATION

The support materials are very minimal. However, the disk is easy to use and has limited objectives. The brochure is adequate in terms of what support this program needs.

SUMMATION

The disk is intended to provide speed drills on number facts. Within those limited objectives, it does a good job. The provision of a number of different "games", the re-presentation of incorrect answers, varying quantitative feedback and technical design are all strengths to a reasonably priced disk.

STATUS

"Fast Facts" has been designated as a **SUPPLEMENTARY** learning resource for grades 1-6.

PURCHASE INFORMATION

This product may be purchased for $34.95 U.S. (1985) from EduSoft at the address given at the beginning of the report. Defective diskettes will be replaced without charge within a 90 day warranty period. Thereafter, diskettes may be replaced for $5.00. EduSoft authorizes the original purchaser of each program to make one backup copy of each program for archival purposes.

Edusoft offers a special site license giving schools full legal permission to make multiple copies for individual machines or to load the program on a hard disk networking system for an additional $35 U.S. Five sets of documentation are also included.

This diskette has the advantage of being capable of operation with more than one machine at a time provided that only one "game" is accessed; however, such use is subject to copyright laws and any license or purchase agreement.

FAY'S WORD RALLY

DESCRIPTION

Title: Fay's Word Rally
Author(s): Kidsoft Computerware
Publisher: Didatech Software
Source: c/o Kidsoft Computerware, 2632 West 13th Avenue, Vancouver, B.C. V6K 2T2
Subjects: Language Arts
Topics: Sight word acquisition, sentence comprehension, vocabulary development, reasoning skills development
Components: 1 double-sided disk, backup, teacher's guide (77p.); Supplementary data diskettes are also available
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monitor
Other Formats Available (not evaluated): Commodore 64

Version: 1984
Display Language: English
Cost: $59.95 (1986)
Tel. #: (604) 734-0465
Users: Grades 2-6

OBJECTIVES

This program is designed as a supplement to teacher instruction in order to reinforce and review sight word acquisition, sentence comprehension, vocabulary development, reasoning skills such as seeing relationships, classifying, recognizing categories, and comparing and contrasting. The program also reinforces rhyming and phonics skills.

PEDAGOGICAL CONTENT DESCRIPTION

The four components of this program consist of the keyboard tutorial, directions for playing the game, game options and the game itself. There is also a recordkeeping system and a section for teachers and students to input their own sets of words and clues. This program includes the basic words from the Ginn 720 reading series, levels two to nine, and enrichment words from levels eight and nine. A game format is used to present eighty sets of words and clues which increase in difficulty and are intended for grades one, two and three. Each set presents a maze in which nine words can be found. The student must read the clue at the bottom of the screen to determine the word required in the maze and then drive the car through the maze to that word. The clues may include context, opposites, synonyms, homonyms, categories, rhymes, definitions and visual clues. Points are won or lost by driving the car over the correct or incorrect word.

PEDAGOGICAL CONTENT EVALUATION

The range of content and the sequence of presentation are appropriate for the target audience. The program is sequentially developed and presents the vocabulary from easy to difficult in an effective manner. The clues which are presented for the identification of each word in a set are well distributed to cover the intended skills. From the clues presented, the student must decide which strategy is needed and must implement it. The variety of clues stimulate interest and keep the student's attention. It was noted that in a few cases the clues were ambiguous and the context clues appeared to be long and required too much reading. The content is accurate and the general readability is appropriate for most students. Although the program was prepared to be used in correlation with the Ginn 720 reading series, it can be modified to be used with other series by the teacher developing his/her own sets of words and clues.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of menu selection, name entry, reading a sentence, phrase or picture clue, matching the clue to a word in the maze and then driving the car through the maze to hit the word. Four keys are used to move the car through the maze: A (up), Z (down) and arrow keys to move right or left. The preprogrammed clues appear in a variety of forms and are selected randomly from a limited data bank in each set. Word presentation for each set is also preprogrammed, but the location of words within the maze is randomized.

Feedback is provided after all user responses. Graphical and audio feedback messages are used throughout the program. Correct answers are rewarded with the same graphic (Fay waves her flag and jumps up and down) and music plays. An incorrect response results in Fay moving her flag down with no sound and a loss of five points. Quantitative feedback consists of a running total being shown at the top right of the screen and a screen indicating the student's final score.

No pre- or post-tests are included. Unless a mastery level is chosen by the student or pre-selected by the teacher, the level of achievement is arbitrarily set at seventy. No branching is provided in this program; however, the student who does not achieve the chosen mastery level does not proceed to the next set until mastery is achieved. Sets will be repeated with a different order of words and clues.

INSTRUCTIONAL FORMAT EVALUATION

Student interaction is appropriate and effective for the target audience. Once the student has mastered the car control keys or joystick, interaction with the program is easy and the student is always actively involved. The time limit option for sets thirty to eighty enhances the students' interest and is effective. The students enjoy manipulating the keys to drive the car and they develop a strategy to follow the most direct route. However, the teacher must check to see that the student is not ignoring the clues under the maze and manipulating the cars without consideration of this important learning part of the program. The time required for each game is usually less than ten minutes and is well within the attention span of the users. Some students will be able to play two or three games at one sitting.

Feedback is immediate and both positive and negative feedback are appropriate. Quantitative feedback is continuous and provides suitable information at the end of the game.

TECHNICAL CHARACTERISTICS DESCRIPTION

Graphics, sound and color are used in this program. Upper and lower case letters are used in the text. Instructions using simple language and graphics are provided at the beginning of the disk to teach the user how to use the program.

TECHNICAL CHARACTERISTICS EVALUATION

The displays are well designed with character size that is appropriate and effective. Upper and lower case letters are used suitably. Graphics, color and optional sound are all appropriate. The program can also be used effectively on a monochrome monitor; however, a few graphic clues which were not too clear on the monochrome monitor may be more effective on a color monitor. The animation used in graphics adds interest to the program and the program is user friendly. One analyst noted that the clicking prompt (foot tapping) interfered with some students' concentration.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

Since the vocabulary correlates with the Ginn 720 reading series, the students who are not using this series should be taught the vocabulary before using the program. The sets should be done in chronological order.

The program's optional record keeping system has a capacity of up to forty students on any one disk. It records the highest score, lowest score, total number of times the set was played and the total number of times the set was played at the last sitting for each student. It can also display the students' names who have played one particular set listing their scores. Student records can be printed.

The teacher documentation (77 pages) includes educational objectives, suggested grade levels, pre-activities, strategies for integration, an explanation of the management system, a sample program run, program operating instructions, instructions for creating your own game, and a tutorial for making picture clues. The appendix includes an analysis of the clues used, a list of the words the student should know before beginning the program, an aphabetical list of all the target words, a trouble shooting guide and information on the authors. There are six pages of student worksheets included in the documentation. They include two optional record keeping sheets, two sheets showing the Set 1 maze and clues and two pages with eight samples of choices to be made at the beginning of the program.

IMPLEMENTATIONAL SUPPORT EVALUATION

The management system functions operate as described and the system is easy to set up and use. Although the capacity is limited, further copies of the data disk can be made and used. It would be beneficial to have included this process in the documentation. Data is easily and effectively collected but the student must leave the program properly or the information will be lost.

The teacher documentation is very good and contains all the features required to make effective use of this program. The user support materials, though limited, are helpful.

This program can be used by a teacher with minimal computer competency and even the section on creating your own game is relatively easy to implement. This allows the program to be used outside of just the language arts program. The program will require little supervision after a suitable introduction has been done.

SUPPLEMENTAL DISKS

Two supplemental disk packages are available to extend the program beyond the Ginn 720 Series, Levels two to nine. Both have to be used in conjunction with the program diskette described above.

Available for purchase is a Ginn Intermediate Data Diskette which provides drills on the Ginn 720 Reading Series for levels 10 to 13 and which thus allows the game to be extended to grade 5 and 6 students. The basic game is the same but three new types of clues have been included which require higher level thinking skills.

A Houghton Mifflin data diskette will provide drills based on the Houghton Mifflin reading series. As this is not an authorized series in Alberta, this diskette was not evaluated.

SUMMATION

This program is interesting, well designed and provides good drill and practice. The game format makes learning fun. The documentation is very good and the inclusion of word lists is most helpful. The management system is good, easy to use and provides adequate information. The authoring system for entering additional word lists and clues is also a very good feature and it increases the usefulness of the program.

The main weakness of the program is the lack of a review branch for those words incorrectly chosen on the first try. Review includes all the words in a set rather than just those missed.

STATUS

"Fay's Word Rally" has been authorized as a **SUPPLEMENTARY** learning resource for grades 2-6.

PURCHASE INFORMATION

The main program, covering Ginn Levels 2-9 and including a record keeping system and authoring system, costs $59.95 (1986). Multiple copies may be purchased at the following prices: 2-5 @ $49.95 each; 6-9 @ $44.95 each; 10+ @ $39.95 each. A lab pack, consisting of one complete package plus four extra program disks, costs $119.00 (1986).

A supplemental disk covering Ginn Levels 10-13 costs $19.95. Note that the program disk from the original package is required.

A home version containing identical content but without the record keeping or the authoring system costs $34.95. A separate authoring system (CYOG - Create Your Own Game) may be purchased for home use for $24.95

Kidsoft Computerware offers software licenses whereby school districts receive two master disks of the original program, one set of documentation and two master disks of the supplements and then may make as many copies as they wish. The basic district price is $600 plus $60.00 per elementary school. Inquiries should be made with Kidsoft Computerware.

Defective diskettes will be replaced without charge at any time. User damaged diskettes will be replaced for $10 upon return of the disk.

As disk interaction is necessary for accessing different levels and for recording scores, this disk can be used with only one machine at a time.

FAY: THAT MATH WOMAN

DESCRIPTION

Title: Fay: That Math Woman
Authors: David Vincent & Paul Melhus
Publisher: Didatech Software
Source: c/o Kidsoft Computerware, 2632 West 13th Avenue, Vancouver, B.C. V6K 2T2
Subject: Mathematics
Topics: Addition, subtraction, multiplication and division of whole numbers
Components: 1 disk, backup, instruction sheet
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, color monitor preferred
Other Formats Available (not evaluated): Commodore 64
Alberta Education Call No.: QA 139 F282 1983

Version: 1983
Display Language: English
Cost: $44.95 (1986)
Tel. #: (604) 734-0465
Users : Grades 2-3

NOTE:

This evaluation is based on the 1983 version of the product. The current version now has an authoring and a record keeping system.

OBJECTIVES

This program is designed to reinforce student skills in:

1. Recalling basic arithmetic facts up to and including 19
2. Completing basic operations with whole numbers at the pictorial and abstract levels
3. Using the number line to solve arithmetic equations
4. Conceptualizing subtraction as the inverse of addition and division as the inverse of multiplication
5. Recognizing multiplication as the grouping of equal numbers
6. Understanding the concepts of less than and greater than.

PEDAGOGICAL CONTENT DESCRIPTION

This program provides drill on the addition, subtraction, multiplication and division of whole numbers less than nineteen. The menu offers eight choices: addition; subtraction; addition and subtraction; multiplication; division; all four operations; help and exit.

Programs 1, 2, 5 and 6 present 15 problems in various arithmetic drill areas in which questions are "enacted" on a 0 - 18 number line. Programs 3 and 6 are arithmetic games which terminate when a student takes too long to answer a question. The "Help" program provides instruction on entering answers, controlling sound, and temporarily interrupting a program.

Each question is given a point value with that value decreasing as the length of time a student takes to answer a question increases. After each program is completed the student is given the option of proceeding to the next level or returning to the menu to choose a different level.

PEDAGOGICAL CONTENT EVALUATION

Portraying all questions on a 0 - 18 number line adds clarity to abstract concepts but necessarily limits the range. (This is particularly evident in the multiplication and division sections.) While students have the option of selecting any program from the menu, proceeding through the programs in order provides excellent sequencing in that it begins with addition, then introduces subtraction, and next combines these two in a game format. Similarly, multiplication is introduced, followed by division and finally a cumulative game combines all four activities. Sequencing is also evident in the corrective feedback in that if a student misses an answer (s)he is dropped back one level and given easier computational problems to build his/her skill. The option of repeating any section insures adequate depth.

Since "Elevator Math" sections depend upon slow responses in order to terminate, brighter students may end up working on these sections for a long period of time with little new learning taking place.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of number entry for menu selection and answer input followed by pressing the RETURN key. Questions are effectively randomized within each program and immediate feedback is provided. For a correct answer, Fay moves along the number line the appropriate number of spaces, smiles, jumps up and down, and then jumps up to the next number line. For an incorrect answer, Fay moves along the number line to the incorrect answer, gives a "raspberry" sound, and then the same question is reposed. A second incorrect response results in a repeat of Fay's actions followed by Fay doing a demonstration of how to achieve the correct answer. After two errors, Fay drops down one number line. The points awarded for each correct answer are in indirect proportion to the amount of time taken to answer a question. In levels 3 and 6 Fay is chased by a set of random numbers which increase in proximity in direct proportion to the time taken to answer a question. When they catch Fay the game is over.

INSTRUCTIONAL FORMAT EVALUATION

The instructional technique and amount of student interaction are appropriate for the target audience. The fact that the number line extends only to 18 may restrict the potential use of this program by above average students, especially those in grades 3 and 4. Questions are randomly generated and feedback is effective. Fay walks the number line to visually impact both correct and negative responses. A second incorrect response is followed by Fay enacting the correct answer with sound being advantageously used to reinforce the counting process.

Students may experience some confusion in the addition section due to the fact that two different number line models are used. In Level 1 and on the bottom number line of Levels 3 and 6, "a + b" is enacted by Fay starting at zero, walking to "a", and then walking to "b". On the remaining number lines "a + b" is depicted by Fay starting at point "a" and walking to point "b".

Motivation is kept high by:

1. Being able to see the answer being logically stepped out
2. Having the score obtained tied to the number of seconds taken to respond
3. Presenting a cumulative end score
4. Flashing the name of the student with the highest end score at the beginning of each program.
5. Visual impacting by moving Fay up one level each time a response is correct.

The fact that this disk uses a female figure to enact mathematical solutions may aid in breaking down the stereotype that "math is for boys".

TECHNICAL CHARACTERISTICS DESCRIPTION

Color and high resolution graphics are used to depict the number line, the scoreboard display, and the animated character Fay. Sound can be user disabled.

TECHNICAL CHARACTERISTICS EVALUATION

This program makes excellent use of animated graphics to have Fay "walk out" the answer. While this could be an interesting approach to teaching relationships, it does become tiresome with time. Sound, which can be disabled, adds interest. The only branching allowed in this program is pressing ESCAPE to freeze or restart the program and this becomes a negative feature in that it can be used to default the timed response score. The program is thoroughly bomb proofed. It is designed to only accept numbers of 18 or less, it checks for and rejects swear words, etc. Independent use of the program is hampered by the fact that instructions are not presented at the beginning; however, they are available as a help option.

SUMMATION

This program utilizes fine technical design to provide motivating drill exercises in the basic arithmetic functions of addition, subtraction, multiplication and division of whole numbers up to and including 18.

STATUS

"Fay: That Math Woman" has been designated as a **SUPPLEMENTARY** learning resource for Grade 2 and 3 students.

PURCHASE INFORMATION

This product may be purchased for $44.95 (1986) from Kidsoft Computerware at the address given at the beginning of the report. Lab packs, consisting of one complete product plus 4 additional copies of the software, are available for $84.95 (1986). Purchases of 10 copies or more of any Didatech product may be made at a 25% discount. Defective diskettes will be replaced without charge at any time. Disks which are damaged by the user will be replaced for $10 upon return of the diskette.

This disk is capable of operation with more than one machine provided that drills in more than one level are not required; however, such use is subject to copyright laws and any license or purchase agreement.

FLAME LIFE

DESCRIPTION

Title: Flame Life
Author(s): John Olsen et al
Publisher: Queen's University
Source: Software Services, Queen's University, Kingston, Ontario, K7L 3N6
Subject: Science
Topics: Simulation on the length a candle burns under varying conditions
Components: 1 disk, teacher's guide (14p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monochrome monitor, printer (optional)
Other Formats Available (not evaluated): Available in Apple format only

Version: 1984 Ver.1.1
Display Language: English
Cost: $40.00 (1985)
Tel. #: (613) 547-6975
Users: Grades 6 & 9

OBJECTIVES

The stated objectives deal with graphing, inquiry skills and computer literacy. On completion of the program the student should be able to label the x and y axes, select appropriate scales for the axes, plot coordinates, interpolate, extrapolate and identify trends in graphing. The student will develop skills in making predictions, controlling variables, hypothesizing and interpreting data. Students can also see how computer simulations are useful for studying events that occur in nature.

PEDAGOGICAL CONTENT DESCRIPTION

"Flame Life" simulates the burning of candles in a limited atmosphere of an inverted beaker. The user may observe different burning times by manipulating the number of candles to be placed under the beaker, the beaker size and the height of the candles used. After exploring the variables, the user may choose to manipulate one or more of the variables, predict the results and view a line graph of the result. The program allows for more data collection if the student is unsure of the conclusion. The collection of data may also be used separately to promote the learning of the following graphing skills: labelling x and y axes; selecting appropriate scales for x and y axes; plotting coordinates; interpretating data and predicting trends.

PEDAGOGICAL CONTENT EVALUATION

The program assumes that the student has previous experience with graphing. The length of each simulation is well within the user's attention span. The option of continuing with further trials is good and the teacher is able to preset this number. The graph displaying the results of the experiment is clear; however, the interpretation of the trial results and graph is limited to a simple question which does not really promote critical thinking. The user has the opportunity to examine the advantages of computer simulation especially in terms of variable manipulation and the collection of data through numerous trials. The opportunity to make predictions based on data collected is a useful and beneficial part of the program.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of name entry; menu selection; use of the space bar to "light" candles, to stop the timer and turn pages; choice of candle height, container size and number of candles, time entry, prediction of the outcome of each trial; and a response to one multiple choice question at the end of the simulation. Questions involve the selection of variables such as container size, number and size of candles and predicting resultant outcomes. After completion of a set number of questions, the student may request a graph to be presented using the trial data. This is followed by a simple question asking how this variable affects flame life.

Correct responses result in a short congratulatory message while incorrect answers result in the user being encouraged to examine the data and to try again. When responding to the question at the end of an experiment, the first incorrect answer causes the graph to reappear and another chance is given to respond. The second incorrect response gives a message to gather more data or ask the teacher for some help.

Pre-tests, post-tests and branching are not provided in this program.

INSTRUCTIONAL FORMAT EVALUATION

This program is useful in assisting a student to develop process skills. The students can interact easily with the program and most of the younger target audience will enjoy this type of learning experience if a reasonable number of experiments is used. Feedback is only adequate in that negative responses do not receive sufficient assistance. When a student incorrectly inputs the time that the candle burned, little explanation is given for the type of error and no branches are available to promote greater understanding of a specific skill. Furthermore, a student can respond incorrectly for an indefinite number of times without ever receiving the correct answer. The single questions which are provided at the end of an experiment are generally too limited and are lengthy and poorly written. This section requires better item writing skills and expansion to be a useful part of the program. Fortunately, this section can be deleted by the teacher prior to student use. The presentation of a graph based on collected data is good but the procedure used to construct the graph and the interpretation of the resulting graph is not covered adequately. The opportunity for the student to make predictions is a very useful component of the program; however, the predictions are not used in as meaningful a way as they could be.

TECHNICAL CHARACTERISTICS DESCRIPTION

Text is presented in a combination of upper and lower case letters. High resolution graphics including some animation are used. Sound is used for a wrong choice in one selection level. Color is used in the graphics.

TECHNICAL CHARACTERISTICS EVALUATION

The displays are generally well formatted and easy to read. The character size, graphics and data tabulation all promote the presentation of the content. The students will have little difficulty using this program with perhaps the exception of the question at the end of each section. It is noted that if the option to print is made and the printer is not connected or on, the program will lock up. A student can't quit in the middle of a program without rebooting, but it is easy to get to the main menu at the end of each section.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

No management system is provided; however, there is a teacher menu which permits control of student activities or presentation of information. The menu includes: display graph, interpret graph, printout results, explore only and maximum trial (range is 5 - 10).

The teacher documentation provides an overview of the program, including the rationale and objectives; describes how to use the program using the student menu and the teacher option menu; outlines suggestions of use in the classroom; and offers worksheet suggestions. No other user support materials are included.

IMPLEMENTATIONAL SUPPORT EVALUATION

Since this program involves graph reading and use of tables, these skills will have to be introduced before students can use the program effectively. The teacher menu is easy to use but is limited in scope. The teacher documentation is sufficient for implementation of the program.

SUMMATION

The use of computer simulations to illustrate and examine scientific concepts is an excellent use of the media. This program utilizes a simulation effectively to provide a visual display of burning candles under varying conditions. The presentation of the data in a form of a graph is also effective use of this medium; however, the interpretation of the data, the skills for making predictions and graphing procedures could be expanded. The questions posed at the end of each simulation are poorly designed.

STATUS

"Flame Life" has been authorized as a **SUPPLEMENTARY** learning resource for Grade 6 and Grade 9 Science.

PURCHASE INFORMATION

This product may be purchased for $40.00 (1985) from Queen's University at the address given at the beginning of the report. The disk is supplied in an unprotected form and one back-up disk may be made. Purchasers are prohibited from making more than one copy or from using the program and any copy of it concurrently on more than one microcomputer system for any reason whatsoever.

Queen's University warrants the diskette on which the program is furnished to be free from defects in materials and workmanship under normal use for a period of 90 days from the date of delivery. No other warranty is provided.

FRACTION FACTORY

DESCRIPTION

Title: Fraction Factory
Author: Robert Evestone
Publisher: Springboard Software
Source: 7808 Creekridge Circle, Minneapolis, MN, 55435
Subject: Mathematics
Version: 1983
Display Language: English
Cost: $29.95 U.S. (1985)
Tel. #: (612) 944-3915
Users : Grades 3 - 6
Topics: Fractions of a set, equivalent fractions, fractions of a number, addition and subtraction of fractions
Components: 1 disk, teacher's guide (6p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, color monitor preferred
Other Formats Available (not evaluated): IBM PC, Atari, Commodore 64

OBJECTIVES

This disk is designed to provide drill and practice in:

1. Writing fractions
2. Writing fractional equivalents
3. Finding a fractional part of a whole number
4. Adding proper fractions of different denominators
5. Subtracting proper fractions.

PEDAGOGICAL CONTENT DESCRIPTION

The program offers the user drill and practice in five different areas: finding fractions of a set, finding equivalent fractions, finding fractions of a number, adding fractions, and subtracting fractions. The program uses graphics such as number lines and rectangles divided into equal portions and symbols such as hearts, diamonds, circles, trees and asterisks to portray problems. Each game consists of ten questions.

PEDAGOGICAL CONTENT EVALUATION

Content range is appropriate for the target audience. There is good sequencing from one program to the next and linear sequencing results in an increasing complexity of problems (i.e. an increase in the size of the denominator). Depth is effective in that the student is given 10 questions but has the option of choosing to do ten additional problems.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of menu selection, page turning, entry of the numerical, Y, N and ESCAPE keys. Three types of questions are posed: word questions, computational problems and visual problems, all of which require numerical input. Visual feedback is provided for each correct reponse. This is then "tallied" and culminates in visual and sound feedback when 10 correct answers have been entered. Incorrect reponses receive successively more detailed prompts, with the correct answer being displayed in conjunction with the last prompt. Sequence and rate are user controlled while the amount is program controlled.

INSTRUCTIONAL FORMAT EVALUATION

The type of questioning and amount of student interaction are appropriate and feedback is effective. Explanations appropriately include both text and a demonstration example. The program only records correctly answered questions. While this provides positive reinforcement, some indication of the total number of questions attempted and the number answered incorrectly may provide useful evaluation. The program does not incorporate any form of remedial branching for the student who may be experiencing difficulty. For example, a student who answers 20 successive questions incorrectly is simply posed with another problem rather than being given instructional assistance.

TECHNICAL CHARACTERISTICS DESCRIPTION

High resolution colored graphics and sound are used throughout the program.

TECHNICAL CHARACTERISTICS EVALUATION

Colored graphics are effective in conveying concepts and in aiding student motivation, although the "bouncing head" moving up a staircase for positive reinforcement proves very time consuming. The picture menu is also time consuming and adds little to the package. A word menu however is available. While sound adds interest, it unfortunately cannot be user disabled and may prove disruptive in a classroom. Large sized text is appropriately used.

SUMMATION

This program effectively utilizes graphics, color and sound to convey instructional concepts. While the program does not incorporate any remedial branching or record of incorrect reponses, incremental prompts to incorrect responses are well done. Sequencing from easy to difficult within the programs is also well done.

STATUS

"Fraction Factory" has been authorized as a **SUPPLEMENTARY** learning resource for grades 3-6.

PURCHASE INFORMATION

This product may be purchased for $29.95 U.S. (1985) from Springboard Software at the address given at the beginning of the report. A backup diskette may be purchased for $12 U.S.

If within 30 days of the date of purchase, the owner decides that the software is not helping to develop the child's creative skills, Springboard will refund the purchase price. Defective diskettes will be replaced without charge within a 30 day warranty period. After 30 days, a replacement for a defective diskette can be obtained by sending the original product and $5.00 to the manufacturer provided that an extended warranty card has been filed.

The diskette has the advantage of being capable of operation with more than one machine at a time provided that activities are not changed. However, such use is subject to copyright laws and any license or purchase agreement.

FREE ENTERPRISE

DESCRIPTION

Title: Free Enterprise
Publisher: Science Research Associates
Source: 707 Gordon Baker Rd., Willowdale, Ontario M2H 2S6
Subject: Business Education
Topics: Business Competition

Version: 1983
Cost: $140.00 (1984)
Tel. #: (416) 497-7707
Users : Grades 11 - 12

Components: 1 disk, guide (16p.), pad of record sheets, pad of decision sheets
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monochrome monitor, blank disks, printer strongly recommended
IBM PC, 64K, monitor, blank disks, printer strongly recommended
Other Formats Available (not evaluated): Available in Apple and IBM versions only
Alberta Education Call No.: HF 5351 F853 1983

OBJECTIVES

This program is designed to teach tie fundamentals of business organization, decision making, and analyzing of operations via a simulation of corporate activity.

PEDAGOGICAL CONTENT DESCRIPTION

Up to six students or groups of students compete against one another to generate the most favorable financial business activity for a given period. Users can choose one of three skill levels: beginner, intermediate or advanced. Parameters such as interest rates, market trends and news events which may affect productivity are randomly chosen by the computer at the beginning of each quarter's activities. Stock market reports, industry and market surveys, as well as confidential company reports are generated to aid the player in making his/her corporate decisions. Once the user inputs a decision, the program moves ahead to the next fiscal period where the cycle of reports is repeated. Games are open ended--they can be ended or saved for continuation at the end of each fiscal period. The player's success is measured by the stock market price--the winner is the player with the highest stock market price at the beginning of the thireenth quarter.

PEDAGOGICAL CONTENT EVALUATION

As a game, this program has many meits. It provides an effective simulation of corporate decision making and its effects on the business operation of the company. The resulting computer generated reports provide detailed information on the effect of a decision on the profit/loss position of a company. The element of competition between students induces careful decisionmaking.

This program does not instruct, raher it assumes that students already possess a firm understanding of stock market prices, market surveys, loans ad interest payments, dividends, the impact of advertising and/or research and development, and are skilled in analyzing and interpreting company reports. The program itself offers a realistic application of these free enterprise concepts. There is no pre-ordered sequence--players are plunged immediately into all aspects of high finace. Depth is limited only by the player's decision to end.

The clarity of terms is vague if thedisk is used alone and the accompanying written documentation is essential for efficient use of this simulation. Also, some content inconsistencies were noted such as a decline in market value when sales increased. Although tis conceivably could happen in the unusual situation of a company offering goods near or below cost for an extnded period of time and thus sliding towards bankruptcy, this situation is comparatively rare and an explanation of such unusual occurrences is in order.

INSTRUCTIONAL FORMAT DESCRIPTION

Students can call up charts and tables which they must interpret and use as a basis for entering decisions relevant to changes in price, producton, advertising, etc. Feedback consists of a beep to signify an incorrect entry and the provision of financial reprts and charts (which can be obtained in hard copy) to indicate changes in the company status. Branching allows students to select one of three playing levels and to elect to see or skip over various reports. Sequence is dermined by the program while rate is user controlled. Greater control of playing parameters is provided at the advnced level than is available to novice players.

INSTRUCTIONAL FORMAT EVALUATION

Neither the content nor the feedback of this program offers instruction; it simply reflects the choices made by the user as (s)he plays through the simulation. Although the manual provides limited information regarding the effect of altering parameters, much more detailed information would be desirable.

A typical game covers a period of three years. Depending upon the number of companies in competition and the options of operation selected, the actual playing time could prove to be quite lengthy (40 or more hours). To insure maximum learning, students would have to be thoroughly taught the principles of business competition and the teacher would have to interact via group discussions and analysis of printouts at regular intervals (ideally at the end of each quarter of operation). Feedback is limited to the adjusted company reports provided at quarterly intervals from which the user must make his/her own decision--no guiding questions or prompts of any kind are given during normal company operations.

TECHNICAL CHARACTERISTICS DESCRIPTION

Text is presented in combination upper/lower case. Graphics are used to depict the scales on a bar graph. Sound is used to call attention to incorrect entries. Color is not utilized.

TECHNICAL CHARACTERISTICS EVALUATION

Technical design is excellent. Material is clear and easy to read, transitions from display to display are appropriate and input methods are consistent throughout. The program is reliable under normal classroom use.

SUMMATION

This disk provides a realistic application of free enterprise concepts; however, teachers must be prepared to:

1. provide initial instruction in basic business terminology and the principles of business competition.
2. devote up to 40 hours of classroom time for maximum playing benefit.
3. interact with students to ensure they are correctly interpreting the generated reports.

The disk has close parallels with Modules 4 (Economic Concepts), 6 (Management Techniques) and 8 (Small Business Management) of the Alberta Basic Business Curriculum.

APPLE - IBM VERSIONS

A comparison of the Apple/IBM versions revealed no significant content or instructional differences. The user is reminded, however, that the IBM program requires that DOS be saved on the disk prior to initial use of the program. Note that either DOS 1.0 or DOS 1.1 will work but loading DOS 2.0 will cause part of the disk to be erased.

STATUS

The Apple and IBM versions of "Free Enterprise" have been authorized as **RECOMMENDED** learning resources for Basic Business 20/30 and Marketing 20/30.

PURCHASE INFORMATION

Alberta schools may purchase this product from the School Book Branch for approximately $75 (1985). Defective diskettes will be replaced without charge within a 90 day warranty period. Thereafter, diskettes may be replaced for approximately $20.00. There is no time limit on this warranty.

GEOMETRIC CONCEPTS: AREA

DESCRIPTION

Title: Geometric Concepts: Area
Author: Dr. Lola J. May
Publisher: Jostens Learning Systems
Source: c/o Trinity Ventures Corp., B5-4255 Arbutus, Vancouver, B.C. V6J 4R1
Subject: Mathematics
Topics: Area of rectangles, squares, parallelograms and triangles
Components: 3 disks, teacher's guide (52p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, color monitor preferred
Other Formats Available (not evaluated): Available in Apple format only
Alberta Education Call No.: QA 459 G345a 1983

Version: 1983
Display Language: English
Cost: $120.00 U.S (1985)
Tel. #: (604) 734-0232
Users : Grades 6 - 9

OBJECTIVES

After completing these disks the student will be able to apply the appropriate formula to calculate the area of a rectangle, square, triangle, parallelogram, or irregular region composed of rectangles.

PEDAGOGICAL CONTENT DESCRIPTION

This package contains three disks, Series C, D, and E, each of which has six instruction units, four review units and two test units.

SERIES C explores the area of rectangles and squares by counting the number of squares contained in an outline, developing the formula "A=lw", and applying this formula to calculate the area of various rectangular figures. All measurements are metricated and are limited to whole numbers. A student is allowed two or more errors before (s)he is directed to a review lesson.

SERIES D explores the calculation of the area of irregular figures composed of rectangular shapes by calculating the area of the various small rectangles, totalling them, and adding/subtracting them from the whole. Lessons progress from simple to more complex shapes, and students are expected to do pencil and paper calculations.

SERIES E develops the formula for the calculation of the area of a triangle, and provides practice problems, review sections and an evaluation.

PEDAGOGICAL CONTENT EVALUATION

Content range is appropriate for the lower end of the target audience and could be used for review and remediation by grade eight and nine students. Sequence is logically developed. Definitions and explanations are effectively handled and examples are clearly presented. Hints are given to guide the student to the correct answer; however, they are not always specific enough to lead to a further understanding of the problem. As depth is somewhat shallow, program strength would be improved by including more practice problems on the disk and/or as part of the user support materials.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of the entry of his/her name and class number, hitting the RETURN key to turn pages and calculating and entering numerical answers together with their appropriate units. Typing "H" or "F" will access hints or formulas.

Questions are pre-programmed. Feedback is immediate: correct responses receive positive comments such as "Good Work"; incorrect responses receive the message "Think" followed by a hint. After two incorrect attempts the answer (complete with a step-by-step solution in some cases) is given. Quantitative feedback is provided at the end of all units with the exception of the review units.

Sequence and amount are program controlled; rate is user controlled.

INSTRUCTIONAL FORMAT EVALUATION

The instructional technique is appropriate and effective for the target audience and frequent student interaction aids motivation. Pre-programmed questions result in logical, sequential topic development. Feedback is generally appropriate; however, sometimes the negative feedback does not distinguish between a wrong answer and wrong format. Help branches are good but explanations should be expanded. Tests accurately reflect the content covered; however, the record keeping system computes totals only and does not diagnose students' weak areas.

TECHNICAL CHARACTERISTICS DESCRIPTION

These disks use combination upper/lower case lettering. High resolution colored graphics are used to portray shapes and directional arrows.

TECHNICAL CHARACTERISTICS EVALUATION

Displays are clear and well formatted and transition from one to another is smooth. Color adds interest but is not mandatory for program operation. Younger students may be overwhelmed by the amount of textual explanations. The use of upper case letters to label diagrams is non-traditional and may be confusing (e.g. [illegible] should be [illegible]).

IMPLEMENTATIONAL SUPPORT DESCRIPTION

The management system offers five options: Display entire class list; Display a single record; Erase a student record; Change disk or class number; Exit the management system. Student records are automatically created as users enter their name upon booting the disk. Teachers have the option of viewing student scores on the screen or in hard copy form. A maximum of [illegible] records are allowed and these can be divided into eight groups or classes.

IMPLEMENTAT:ONAL SUPPORT EVALUATION

The management system is easy to use and all functions operate as outlined. The fact that all class lists are automatically alphabetized is a program plus. Collecting and printing student data is easy; however, as the program prints a total percentage score only, no diagnostic data is available. The addition of a feature to allow teacher control of student entry points and/or learning sequences would be helpful.

SUMMATION

The program content is well suited to computer instruction. Good incremental sequencing combined with automatically invoked review sequences for students experiencing difficulty results in sound educational design.

STATUS

"Geometric Concepts: Area" has been designated as a SUPPLEMENTARY learning resource for Grades [illegible].

PURCHASE INFORMATION

This product may be purchased for [illegible] U.S. ([illegible]) from Jostens Learning Systems. The Canadian dealer for Alberta is Trinity Ventures Company at the address given at the beginning of the report; no Canadian price was available. Note that if both parts of the Geometric Concepts series are purchased at the same time (Area and Perimeter), a 10% discount is applied.

Defective diskettes will be replaced for [illegible] U.S. - no time limit has been indicated. Other than initially defective diskettes, no warranty is provided.

As disk interaction is frequent, use of the product is limited to one machine at a time per disk.

GEOMETRIC CONCEPTS: PERIMETER

DESCRIPTION

Title: Geometric Concepts: Perimeter
Author: Dr. Lola J. May
Publisher: Jostens Learning Systems Inc
Source: c/o Trinity Ventures Corp., B5-4255 Arbutus, Vancouver, B.C. V6J 4R1
Subject: Mathematics
Topics: Perimeter of rectangles, squares, parallelograms, and triangles
Components: 2 disks, teacher's guide (52p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, color monitor preferred
Other Formats Available (not evaluated): Available in Apple format only
Alberta Education Call No.: QA 459 G345p 1983

Version: 1983
Display Language: English
Cost: $80.00 U.S.(1985)
Tel. #: (604) 734-0232
Users : Grades 5 - 9

OBJECTIVES

After completing these disks, the student will be able to calculate the perimeter of a rectangle, square, triangle, or polygon initially by counting unit lengths along the sides, then by completing an appropriate formula involving the provision of missing lengths, and finally by solving perimeter problems without the aid of diagrams.

PEDAGOGICAL CONTENT DESCRIPTION

This package contains two disks, Series A and Series B, each of which contains six instruction units, four review units, and two test units. Each lesson begins with a page of directions followed by notes and instructions, questions, and drill exercises. Lessons are progressive in difficulty. Students begin with very simple substitution problems and progress to using the formula $P = 2(l+w)$. Users are automatically routed to a review lesson if two or more consecutive errors are made on an instruction lesson.

PEDAGOGICAL CONTENT EVALUATION

Content range is appropriate for the lower end of the target audience and could be used for review and remediation by grades eight and nine students. The logical easy to hard sequence is an advantage but better students may find the rate of progress too slow. The depth is good as there are instruction units, drills and tests. Other strengths are the referral to a review lesson after consecutive errors in the lesson and the provision of help and formula pages.

Some problems with clarity may exist as diagrams are occasionally shaded and at other times outlined--this inconsistency could be confusing to some students. Furthermore, regular shapes do not have their sides labelled to indicate equality, and screen distortion often makes this difficult to determine visually.

Student support materials have not been provided and their addition would greatly enhance the depth and range of material provided.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of entering his/her name and class number, hitting the RETURN key to turn pages, and calculating and entering numerical answers together with their appropriate units. Typing "H" or "F" will access hints or formulas.

Questions are pre-programmed. Feedback is immediate: correct responses receive positive comments such as "Good Work"; incorrect responses receive the message "Think" followed by a hint. After two incorrect attempts the answer (complete with a step-by-step solution in some cases) is given. Quantitative feedback is provided at the end of all units with the exception of the review units. This evaluation is based on the results of the first attempts and provides a total percentage score--no diagnostic evaluation is available.

Sequence and amount are program controlled while rate is user controlled.

INSTRUCTIONAL FORMAT EVALUATION

The instructional technique is appropriate and effective for the target audience and frequent student interaction aids motivation. Pre-programmed questions result in logical, sequential topic development; however, randomized questions would be more appropriate in the advanced lessons as would greater depth of explanation.

Feedback is generally appropriate and the provision of detailed solutions is an advantage. However, the negative feedback does not always distinguish between the wrong answer and the wrong format and help branches should be expanded to provide more assistance than the one or two sentences which are given. Tests accurately reflect the content covered; however, the record keeping system shows total scores only and does not isolate a student's weak areas. The programs lack any defined evaluational criteria for success.

User control is effective, but there is a need for at least some teacher control and less program control in order to effectively individualize instruction.

TECHNICAL CHARACTERISTICS DESCRIPTION

The disks use combination upper/lower case lettering. Colored graphics are used to portray shapes and directional arrows.

TECHNICAL CHARACTERISTICS EVALUATION

Displays are appropriate and change unobtrusively, diagrams are identifiable, and input methods are reasonably consistent. The upper case characters used in formulae are not standard to mathematics and may therefore be misleading. Younger students may find the amount of text material presented per page to sometimes be excessive.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

A management system is included with each disk and it offers five options: Display entire class list; Display a single record; Erase a student record; Change disk or class number; Exit the management system. Student records are automatically created as users enter their name upon booting the disk. Teachers have the option of viewing student scores on the screen or in hard copy form. A maximum of 120 records can be maintained.

IMPLEMENTATIONAL SUPPORT EVALUATION

The management system is easy to use and all functions operate as outlined. The fact that all class lists are automatically alphabetized is a program plus. Collecting and printing student data is easy; however, no diagnostic data is available--the program prints a total percentage score only. There is no password available and hence no program security is offered.

SUMMATION

The major strengths of these disks are the methodical, systematic presentation of material and their general ease of use. Weaknesses include the non-standard use of upper case letters in labelling polygons, insufficient depth of instruction for students not experiencing success, and the lack of diagnostic and prescriptive evaluation data for the teacher via the management system. These weaknesses are minor when compared to the strengths of the content development.

STATUS

"Geometric Concepts: Perimeter" has been designated as a **SUPPLEMENTARY** learning resource for Grades 5-9.

PURCHASE INFORMATION

This product may be purchased for $80.00 U.S. (1985) from Jostens Learning Systems. The Canadian dealer for Alberta is Trinity Ventures Company at the address given at the beginning of the report; no Canadian price was available. Note that if both parts of the Geometric Concepts series are purchased at the same time (Area and Perimeter), a 10% discount is applied.

Defective diskettes will be replaced for $5.00 U.S. - no time limit has been indicated. Other than initially defective diskettes, no warranty is provided.

As disk interaction is frequent, use of the product is limited to one machine at a time per disk.

GRAPHING LINEAR FUNCTIONS

DESCRIPTION

Title: Graphing Linear Functions
Author: Mark Berman, Kevin Vessin & Don Ross
Publisher: Microcomputer Workshops
Source: c/o CBS Interactive Learning, One Fawcett Place, Greenwich, CT 06836
Subject: Mathematics
Topics: Graphing linear functions
Components: 1 diskette, backup, guide (11p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monochrome monitor
IBM PC, 64K, monochrome monitor
Other Formats Available (not evaluated): Commodore 64, TRS 80

Version: 1984
Display Language: English
Cost: $29.95 U.S. (1985)
Tel. #: (203) 622-2500
Users : Grades 9-10

OBJECTIVES

The student will be able to:

1. Change equations in the form of Ax + By + C = 0 to equations in the form of y = mx + b.
2. Determine ordered pairs of integers which satisfy the equation y = mx + b.
3. Plot integral ordered pairs on a cartesian plane.

PEDAGOGICAL CONTENT DESCRIPTION

Following an optional explanation, the user is given the choice of practicing three types of questions:

SECTION 1 - presents the student with a linear equation in the form of y = mx + b and asks for three ordered pairs which satisfy the equation. Each member of the ordered pair must be an integer between -10 and +10. The student then plots the points on a cartesian plane.

SECTION 2 - presents a complex linear equation of the type Ax + By + C = 0 and asks the student to manipulate the equation using the properties of additive and multiplicative inverses to get the equation in the form y = mx + b. As with the first section, ordered pairs of integers then must be found and plotted on the plane.

SECTION 3 - provides the student with a random mix of the first and second sections' problems.

The user may choose to do 1 - 9 problems in each section.

PEDAGOGICAL CONTENT EVALUATION

The range of content is appropriate for the target audience. While the major concept is the graphing of linear equations, the inclusion of manipulating algebraic equations provides a good review. The sequencing of content is appropriate and students who are using the program as an introduction to graphing of equations should be encouraged to do the sections in order.

The explanation at the beginning is not designed for original instruction and only provides directions on how proceed through the various solutions steps in the program; explanations on concepts behind those procedures are not given. The student can complete this section merely by following instructions to enter specific keys - no thinking is required.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of name entry, the option of viewing/bypassing instructions, selecting a section from the menu, entry of numerical, alphabetical or symbolic keys as answer input, using the I, J, K, or M keys to move the cursor as part of the plotting routine, and using RETURN to activate page turns. Feedback is provided after all randomly generated questions. Incorrect responses result in a hint as to why the strategy selected will not work followed by the re-posing of the problem; correct answers result in a short, positive message used in conjunction with the student's name. An error in the plotting coordinates section results in either audio or textual feedback. An error summary is provided at the end of each problem and at the end of a run. Rate and amount (to a maximum of 9) are user controlled; sequence is program controlled in that each problem must be solved using the same problem solving pattern.

INSTRUCTIONAL FORMAT EVALUATION

The drill and practice technique utilized by this program is appropriate for the target audience. Student interaction is consistent and provides effective involvement.

Common errors are anticipated and corrective, non-threatening feedback is provided. It should be noted that this will be sufficient to remind students of the correct procedures but will not suffice as original instruction. The quantitative error analysis provided at the end of each question set is useful for both teacher and student alike. Program strength could be improved by allowing the user a second attempt after an incorrect response rather than immediately presenting the correct answer. The audio feedback optionally provided in the plotting help routine is attention getting--indeed, some students may purposely err to activate the audio option. Since a management system is not provided, teacher supervision of students to check on the number and type of errors being made is required.

The presentation of the algorithm is sound. However, users are locked into the algorithm and have no opportunity to skip steps or move at a faster rate. This can make the program boring for students familiar with the process.

TECHNICAL CHARACTERISTICS DESCRIPTION

Text is presented in standard size, upper and lower case print. High resolution graphics are used to outline the tables of ordered pairs and to do the graphing. Sound is used as an optional prompt when an error has been made in plotting an ordered pair. The pitch of a steady beeping rises as the cursor nears the correct position and falls as the cursor moves away.

TECHNICAL CHARACTERISTICS EVALUATION

Although the graphing routines are smoothly drawn, some crowding is noticeable. The character set chosen for the representation of fractions is too small and often results in unreadable numerators or denominators. While the audio feedback is effective, it may prove distracting to other classroom members.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

The twelve page teacher's guide outlines the program's objectives and provides a description of the steps that the student will go through in solving the problems.

IMPLEMENTATIONAL SUPPORT EVALUATION

The teacher's guide is clearly and succinctly written.

SUMMATION

This disk uses the computer's abilities to provide step-by-step guided instruction in the problem solving process of graphing linear functions. The strengths of the program are its structured presentation, its good error trapping and the level of student interaction that is required. While effective in providing practice in graphing linear functions, the lack of variety in the structured, linear progression of this program may cause it to be non-motivational for advanced students.

APPLE - IBM VERSIONS

This report is based on the evaluation of the Apple product. In reviewing the IBM version, it was found that the IBM version did not differ in any substantial fashion.

STATUS

The Apple and IBM versions of "Graphing Linear Functions" have been authorized as **SUPPLEMENTARY** learning resources for grades 9 and 10.

PURCHASE INFORMATION

This product may be purchased for $29.95 U.S. (1985) from CBS Interactive Learning at the address given at the beginning of the report. Lab packs are available in the following quantities and prices: 10 copies @ 3 x list price; 15 copies @ 4 x list price; 20 copies @ 5 x list price; 25 copies @ 6 x list price. The company provides a life time guarantee against defective diskettes and will replace worn out diskettes without charge at any time.

Due to frequent disk interaction, this program can not be used on more than one machine at a time.

GREEN GLOBS & GRAPHING EQUATIONS

DESCRIPTION

Title: Green Globs & Graphing Equations
Author(s): Sharon Dugdale & David Kibbey
Publisher: Sunburst Communications
Source: 390 Washington Avenue, Pleasantville, NY 10570
Subject: Mathematics
Topics: Graphing linear & quadratic equations
Components: 1 disk with backup, teacher's guide (66p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monochrome monitor
Other Formats Available (not evaluated): Available in Apple format only

Version: 1986
Display Language: English
Cost: $59.00 U.S. (1985)
Tel. #: (914) 769-5030
Users: Grades 10 - 12

OBJECTIVES

As a result of using this disk students will:

1. Recognize the basic shapes of graphs.
2. Know how to translate graphs horizontally and vertically and perform other manipulations on them.
3. Locate linear and quadratic graphs that are hidden on a coordinate plane and determine their equations.
4. Experience the plotting of conic equations.

PEDAGOGICAL CONTENT DESCRIPTION

The four programs contained on this disk all deal with the graphing of equations:

EQUATION PLOTTER - This program is a general utility plotter program which can be used with other programs on the disk or with work from textbooks as part of classroom study. It provides the student with the choice of two shapes of grids (rectangular or square) which the students can use to plot x and y coordinates. Functions may include trigonometric, square root, absolute value, natural logarithm and exponential functions.

LINEAR AND QUADRATIC EQUATIONS - Students, given a choice of difficulty levels, are asked to write an appropriate equation for a given graph chosen from line, parabola, circle, ellipse and hyperbola functions. Successive tries are allowed until the plotted graph of the student equation matches or closely parallels the target graph.

GREEN GLOBS - The computer displays coordinate axes with 13 randomly scattered globs. Given a choice of "novice" or "expert" playing levels, students enter equations which they feel will hit the globs and cause them to explode. The "expert" game adds shot absorbers which stop any shots that touch, so the student must design equations to avoid these points. Functions which may be used include functions beginning with "y" or "x", conics, square roots, absolute value, logarithmic and exponential functions. Trig functions may not be used except in the expert game.

TRACKER - After choosing to play as an "expert" or a "novice", students attempt to locate linear and quadratic graphs (lines, parabolas, circles, ellipses, or hyperbolas) that are hidden in the coordinate plane and determine their equation.

PEDAGOGICAL CONTENT EVALUATION

Provided the student has had prior classroom instruction in graph plotting, this program provides excellent drill and has a good content range for grade 10 - 12 students. The progression from plotting lines to plotting trigonometric functions provides good sequencing. A choice of difficulty levels and the option of branching back for review provides good depth. The variations of each type of equation are well covered and the flexibility of entering a program at different levels provides for varying individual abilities.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of keyboard input of equations which correspond to a given graph, using the RETURN key to accept a selection, and using the ESCAPE key to exit a program. Immediate feedback is provided. Positive feedback consists of a word such as "Right" coupled with the student graph being drawn over the dots, thus causing them to explode. During a game the number of points earned is also shown. Negative feedback is largely left to inference in that the student can see that his/her plotted graph does not match the target graph. A student can enter as many answers as (s)he would like, or by pressing "A" can forfeit the game at which time the answers are shown. The user controls rate and sequence. Advancement within a program is dependent upon user success (i.e. if a student matches a graph on the first try, (s)he advances to the next level).

INSTRUCTIONAL FORMAT EVALUATION

Student interaction is appropriate and the instant graphic comparison of plotted graphs provides good feedback. Because every answer is graphed, the student can learn from his/her mistakes, and the opportunity for unlimited tries at a question is a program strength. Accumulation of points and advancement within a program from one level to the next provides good motivation. The ability to enter a specific program without going through other parts of the disk provides for varying student abilities.

Program strength could be enhanced by: 1) Allowing students to enter sample equations in the introductory program to provide practice in entering equations on a computer (i.e. difference in symbols, shifting for keys, etc.); and 2) Including pretests as a guide for the level at which students should begin working.

TECHNICAL CHARACTERISTICS DESCRIPTION

Screen displays consist of large size, combination upper/lower case text and high resolution graphical displays complete with color. Sound is used to simulate the explosion of globs.

TECHNICAL CHARACTERISTICS EVALUATION

This program utilizes fine technical design. Text is easy to read, graphics are clear, and sound adds an element of excitement to the games.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

A management system automatically records the top ten scores in the games "Green Globs" and "Tracker". Via a password, the teacher has access to the management system and can change names, delete names and score, or start a new records list.

The sixty-six page instructor's manual provides program objectives and descriptions, examples problems, answers, scoring procedures, ideas for classroom use, sample classroom demonstrations, and explains the differences between novice and expert playing levels. It also includes twelve student worksheets which the students may use with "Equation Plotter" to learn mathematical concepts and experiment with graphing techniques.

IMPLEMENTATIONAL SUPPORT EVALUATION

The teacher documentation is easy to read, informative and a valuable resource for classroom implementation. The management system works as described. The disk is easy to use, adaptable to a wide variety of student levels, and requires minimal physical dexterity and little teacher intervention.

SUMMATION

Program content is appropriate to the computer media, and sequence and depth are appropriate to the target audience. The game approach utilized on these disks provides strong incentive for a student to improve his/her graphing abilities. The programs are easy to use, students can enter at varying levels, and little teacher intervention is required.

STATUS

"Green Globs and Graphing Equations" has been authorized as a **SUPPLEMENTARY** learning resource for grades 10-12. Note that this same program (with some differences in documentation and pricing) is available from Conduit under the title "Graphing Equations". See below for more detail on the Conduit package.

PURCHASE INFORMATION

"Green Globs and Graphing Equations" may be purchased for $59.00 U.S. (1985) from Sunburst Communications at the address given at the beginning of the report. A lab pack, consisting of 10 diskettes and one set of teacher documentation is available for $177. U.S. (1985). Sunburst Communications offers a lifetime warranty on their courseware products and will replace defective diskettes at no charge.

This disk has the advantage of being capable of operation on more than one machine at a time; however, such use is subject to copyright and/or license or purchase agreements.

The Conduit version ("Graphing Equations") may be purchased for $60.00 U.S. (1985) from Conduit, University of Iowa, Oakdale Campus, Iowa City, IA 52242 (319) 353-5789. Note that the documentation is considerably smaller and does not include the teacher support (worksheets, suggestions, examples, etc.) that is included in the Sunburst package. Additional copies for student workstations may be obtained by ordering the "Educator Pack" which sells for two times the price of the regular package and includes all materials in the base package plus four additional copies of the software. Additional manuals are not included but may be ordered separately ($2.00). Defective diskettes will be replaced without charge within a 30 day warranty period. Thereafter, disks may be replaced for $10.00. As part of the purchase agreement with Conduit, the buyer agrees that a software disk will be used on only one machine at a time at a single site.

HYDROGEN SPECTRUM

DESCRIPTION

Title: Hydrogen Spectrum
Authors: L. Enstone, K. Sharp, A. Taylor & M. Tunbridge
Publisher: Heinemann Computers in Education
Source: c/o Gage Publishing Ltd., 164 Commander Blvd, Agincourt, ON M1S 3C7
Subject: Science
Topics: Relationship between hydrogen spectral lines and electron energy emissions
Components: 1 diskette and backup, user booklet (8p.), teacher guide (24p.)
System Requirements: Apple II+/IIe only, 48K, 1 disk drive, monochrome monitor
Other Formats Available (not evaluated): Available in Apple format only

Version: 1982
Display Language: English
Cost: $85.00 (1985)
Tel. #: (416) 293-8141
Users: Grade 12

OBJECTIVES

This program is designed to provide a dynamic model to facilitate understanding of the interpretation of the line emission spectrum of atomic hydrogen in terms of electronic transitions between energy levels.

PEDAGOGICAL CONTENT DESCRIPTION

This disk offers two programs:

Program One is designed as a teacher demonstration tool to illustrate the correspondence between energy emissions as electrons jump from high to low energy levels and the spectral lines emitted by the hydrogen atom. Within the program the teacher may: 1) Vary display speeds or proceed step-wise through absorptions and emissions. 2) Control the level to which an electron is moved. 3) Highlight the spectral area associated with one particular series (Lyman, Balmer, Paschen, Brackett or Pfund) 4) Include or exclude a background spectrum which shows with reduced heights where all spectrum lines under consideration can occur. 5) Include or exclude dials which show the energy absorbed or emitted as each electron transition occurs.

Program Two, designed to be used by the student in conjunction with a workbook, guides the user through a series of exercises designed to promote familiarity with the energy level emission model, to discover the proportionality between spectral line frequency and energy differences, and hence to use graphs to evaluate Planck's constant.

PEDAGOGICAL CONTENT EVALUATION

Program One offers good instruction and could be used by the teacher in conjunction with classroom teaching to provide students with the necessary background to begin Program Two. The range of content is appropriate to the target audience, however it does assume that students have had prior experience with graphing and graphical interpretation. Content sequencing is effective as it leads the user from the general to the particular.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of letter selection of menu items, using the space bar for page advancement, utilization of the ESC key for paging backward, and using the arrow keys or special letter keys to activate displays. Questions posed in the student booklet correspond to graphic displays on the disk. The student is advised to have a calculator, paper for recording data and a sheet of graph paper while doing the program. Upon entering a calculated answer, the computer provides feedback in the form of "Correct" or "Incorrect" accompanied by instructions to observe a highlighted area of the screen which is critical in answering the question correctly. The correct answer is then displayed in this position. Although there is no quantitative feedback, questions within the tutorial must be answered to a minimum level of proficiency to allow progress in the tutorial.

INSTRUCTIONAL FORMAT EVALUATION

The student interaction is well suited to the target audience and does not require great computer familiarity. The simulation technique is effective in providing an understanding of abstract concepts. The user is active in the program with each page requiring at least one and sometimes several responses, depending upon the success rate.

Feedback techniques lack variation. Negative feedback is weak in that it does not indicate possible reasons for an error, and the repetitive "correct" given as positive feedback does not prove motivational. Completing the program in its entirety takes at least 2.5 hours; however, different portions of the tutorial program may be completed in stages, or only those sections that the the instructor feels will be beneficial may be done. Rate is effectively user controlled throughout the program.

TECHNICAL CHARACTERISTICS DESCRIPTION

The program makes extensive use of a particular screen format in which the top two-thirds of the screen are used for a high resolution graphics display of the relationship between spectral line and the emission of level-to-level electron changes and the bottom one-third is reserved for text display in a variety of letter sizes. Sound is not used but limited color is present.

TECHNICAL CHARACTERISTICS EVALUATION

This program utilizes fine technical design with well formatted displays and easy to read text. The transfer from one display to another is smooth and logical. The ability to "zoom" in on a particular section of the spectrum for detailed study is a virtue of the program. The inclusion of on-screen commands plus the use of the ESC key to backpage makes the program easy to use, even by novice computer users.

The fact that the spectral line frequencies mentioned in the program and used to generate energy quantities are different from those shown on the spectra graphed at the bottom of the page may lead to unnecessary confusion. Also one of the user stated functions, "S" to control the rate of energy level changes, did not work as described in the program.

Although parts of the program are generated in color, clarity is often better when a monochrome monitor is used (e.g. hollow square depiction).

IMPLEMENTATIONAL SUPPORT DESCRIPTION

An 8 page student's manual (reproducible) provides instructions on program operation and includes exercises that correspond with the screen portions of the program. The 24 page teacher's guide provides instructional objectives, hints on program operation, background information, instructions for varying the parameters, and methods of altering program two and tailoring it to meet individual student needs.

IMPLEMENTATIONAL SUPPORT EVALUATION

Both the student and teacher's guide are indispensable to program operation.

SUMMATION

This disk, complete with its teacher demonstration program, employs sound instructional design and is adaptable to a wide variety of classroom situations.

STATUS

"Hydrogen Spectrum" has been authorized as a **SUPPLEMENTARY** learning resource for Physics 30.

PURCHASE INFORMATION

This product may be purchased for $85.00 (1985) from Gage Publishing Ltd. at the address given at the beginning of the report. Defective diskettes will be replaced without charge within a 90 day warranty period. Thereafter, damaged disks may be replaced for $52.95.

This disk has the advantage of being capable of operation on more than one machine at a time; however, such use is subject to copyright laws and any license or purchase agreement.

IDEAL GASES

DESCRIPTION

Title: Ideal Gases
Series: Introduction to General Chemistry
Authors: Stanley G. Smith, Ruth Chabay & Elizabeth Kean
Publisher: COMPress
Source: P.O. Box 102, Wentworth, NH 03282
Subject: Science
Topics: Boyle's Law, Charles' Law, pressure-temperature relationship
Components: 1 disk, backup, guide (2p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monochrome monitor
Other Formats Available (not evaluated): Available in Apple format only
Alberta Education Call No.: QD 37 I19 1982

Version: 1982
Display Language: English
Cost: $70.00 U.S. (1985)
Tel. #: (603) 764-5831
Users : Senior High +

OBJECTIVES

After completing this program, students will be able to:

1. Describe atmospheric pressure.
2. Know how to use a barometer.
3. Define Boyle's Law, Charles' Law, and the pressure-temperature relationship of an ideal gas.
4. Solve problems dealing with the gas laws outlined in #3.

PEDAGOGICAL CONTENT DESCRIPTION

This program is divided into four sections. The first section on "Atmospheric Pressure" is an introductory tutorial which defines atmospheric pressure and illustrates a method of measuring it. The remaining three sections offer simulations illustrating Boyle's Law, pressure-temperature experiments and Charles' Law and provide sample problems for practice.

User support materials include a sheet explaining answer entry, symbols used to correct misspelled entries, escape, answer help and back-paging features of the program.

PEDAGOGICAL CONTENT EVALUATION

The range, depth, and sequencing are all appropriate for the target audience. Good examples and illustrations are used to clarify textual content. Two inaccuracies were noted: incorrect spellings (e.g. "subtacted" and "reploted" in the pressure-temperature experiment) and scale readings which allow answer inputs beyond a reasonable degree of precision (e.g. 6.8269354 for 6.8). This is inconsistent with the use of significant digits and proper scale reading format.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of program selection, entry of word responses or numerical answers and page turning via the RETURN key. Questions within the tutorial are presented in a pre-programmed order; however, practice problems are randomly chosen within a given range of parameters.

Immediate feedback is provided for all user responses: a correct answer produces the message "OK" accompanied by three musical tones; an incorrect answer produces the message "No" followed by a hint. The correct answer is given after two incorrect attempts. A cumulative scoreboard at the top of the screen keeps track of the number of correct responses and the number of problems remaining.

The amount of information presented is program controlled; however, the user maintains control of both sequence and rate.

INSTRUCTIONAL FORMAT EVALUATION

The instructional format employed is educationally sound in that it allows for varying rates of learning and yet demands a certain level of competency. The user is given the opportunity of generating data from a simulated experiment and is guided through sample problems. Questions in the drill and practice section are effectively randomized; however, they tend to follow predictable patterns in the tutorial sections. Feedback is good. It is non-threatening and immediate and allows for variability within limits of scale readings. The built-in program function to detect spelling errors effectively distinguishes between a wrong answer and a typographical error.

TECHNICAL CHARACTERISTICS DESCRIPTION

Graphics and sound are used in this program. Varying styles of type are used for emphasis. A calculator function allows the student to direct the computer to perform arithmetic calculations.

TECHNICAL CHARACTERISTICS EVALUATION

Displays are well formatted and easy to read. Transitions from display to display are smooth and well-paced. The animated isolation of a variable in an equation aids student understanding.

The provision of a calculator function is a program plus as it allows the student to concentrate on the problem solving methods involved. Students will find it easy to use provided that they are familiar with the basic symbols for multiplication and division and with the standard order of operations.

Negative features relating to technical design include:

1. The program advises a maximum of eight data readings for experiments; however, it allows entry of additional readings. This fouls up subsequent displays of the relationship between the variables by double printing on some lines. Display printing may also be fouled up by entry of an excessively long character string
2. The scale markings used in the Boyle's law simulations are confusing.

SUMMATION

This program effectively utilizes the computer's graphic generation ability to provide interesting simulations and effective drill and practice on problems related to gas laws.

STATUS

"Ideal Gases" has been designated as a **SUPPLEMENTARY** learning resource for enriched senior chemistry classes.

PURCHASE INFORMATION

This product may be purchased for $70.00 U.S. (1985) from COMPress at the address given at the beginning of the report. Defective diskettes will be replaced without charge within a 90 day warranty period. Thereafter, a replacement disk may be purchased for $10.00 (U.S.) upon return of the damaged diskette.

As disk interaction is required to proceed from one unit to the next, use of this program by more than one machine at a time is limited to repeated practice in the same lesson/drill; however, such use is subject to copyright laws and any purchase or license agreement.

INTEGERS/INTEGERS FAST FACTS

DESCRIPTION

Title: Integers/Integer Fast Facts
Authors: Steketee Educational Software
Publisher: EduSoft
Source: P. O. Box 2560, Berkeley, California, 94702
Subject: Mathematics
Topics: Operations with integers
Components: 1 disk, guide (2p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monochrome monitor
Other Formats Available (not evaluated): TRS 80
Alberta Education Call No.: QA 115 I61 1983

Version: 1983
Display Language: English
Cost: $34.95 U.S. (1985)
Tel. #: (415) 548-2304
Users : Grades 4 - 9

OBJECTIVES

To provide instruction and timed drills on integer facts.

PEDAGOGICAL CONTENT DESCRIPTION

The disk contains two separate sections, "Integers" and "Integer Fast Facts".

"Integers" provides instruction and drill. The user selects which operation to practice and the number of questions to be done in addition, subtraction, mixed addition and subtraction, multiplication, division or assorted problems. In addition, the student may elect to do the addition and subtraction questions using a number line or access a statement of rules on multiplication or division questions. An optional quiz is also available covering the same operations and with the same features. Ten questions are done and quantitative feedback is given at the end.

There are three parts to "Integer Fast Facts". Each program allows the user to select the operation that is to be practiced (addition, subtraction, multiplication and division). Most of the programs also allow the user to be drilled on an assortment of operations. During the drill, the user (or the users) answer a minimum of 10 questions, each within 10 seconds. Scores are based on accuracy and speed. If the user elects to play the game again, (s)he is encouraged to beat her/his previous high score.

The three programs are:

1. Solo Integer Facts - 10 questions @ 10 seconds per question
2. Team Integer Facts - a team of 2 to 5 members may play the game
3. Competition Integer Facts - students play against a competitor.

PEDAGOGICAL CONTENT EVALUATION

Content range, sequence and depth are all appropriate. The provision of rules, number lines, six different combinations of operations, optional quiz and timed drills make this an excellent package to either introduce students to integers, provide remedial instruction or present periodic review.

INSTRUCTIONAL FORMAT DESCRIPTION

In both sections students enter numerical answers to questions and select from the various options noted above (choice of program, operations, see the rules, work on the number line, continue, redo wrong questions).

Feedback consists of both sound and aural messages. If the answer is correct, the student sees a text message and hears a short beep. Negative feedback varies. In "Integers" the students is given two attempts after which the program works out addition questions on the number line and rules for multiplication/division questions are shown. If an error is made on a subtraction question, the user is first assisted in converting it to an addition question and then feedback follows as above. In "Integer Fast Facts", only one attempt is provided and digits are evaluated upon entry. If the answer is wrong, a buzz is heard and the correct answer is then presented along with another tone signal. Quantitative feedback is given at the end of the drill. In the timed drills, the user is encouraged to beat his/her score which is based on speed and accuracy. In some games, a "half time" score is also given.

Questions are randomized. If an error is made in the timed drills, the student will be given the choice of increasing his/her score by attempting those questions again.

INSTRUCTIONAL FORMAT EVALUATION

In the timed drills, the user is given only one attempt at a question and thus may be penalized for typing errors. (2 digit answers will be counted wrong immediately if the first digit is incorrect.) As this is intended as a speed drill, this feature is not particularly damaging.

The instructional format of the speed drill is generally good within the restrictions of the format. The re-presentation of errors makes this program a "cut above" the other speed drills.

The instructional format of the regular drill is excellent. The availability of using the number line or seeing rules, the excellent feedback for adding and subtracting questions and the provision of a quiz make this program particularly strong.

TECHNICAL CHARACTERISTICS DESCRIPTION

Text and numbers are presented in large size print. Sound is present but may be turned off at the menu.

TECHNICAL CHARACTERISTICS EVALUATION

The technical design of this disk is good.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

A two page brochure accompanying the product provides a brief introduction to the program (objectives, system requirements, use of the program).

IMPLEMENTATIONAL SUPPORT EVALUATION

The support materials are very minimal. However, the disk is easy to use and has limited objectives. The brochure is adequate in terms of what support this program needs.

SUMMATION

This is an excellent disk. The wide range of options - selecting either specific or mixed operations, determining the number of questions to be attempted, making use of number lines or rules - are all advantageous features. These, plus the excellent negative feedback, make the disk appropriate for a range of abilities for a very reasonable price.

STATUS

"Integers/ Integer Fast Facts" has been designated as a **SUPPLEMENTARY** learning resource for Grades 4-9.

PURCHASE INFORMATION

This product may be purchased for $34.95 U.S. (1985) from EduSoft at the address given at the beginning of the report. Defective diskettes will be replaced without charge within a 90 day warranty period. Thereafter, diskettes may be replaced for $5.00. EduSoft authorizes the original purchaser of each program to make one backup copy of each program for archival purposes.

EduSoft offers a special site license giving schools full legal permission to make multiple copies for individual machines or to load the program on a hard disk networking system for an additional $35 U.S. Five sets of documentation are also included.

This diskette has the advantage of being capable of operation with more than one machine at a time provided that only one "game" is accessed; however, such use is subject to copyright laws and any license or purchase agreement.

INTRODUCTION TO CIRCUITS

DESCRIPTION

Title: Introduction to Circuits
Series: Basic Concepts of Electricity Series (#2)
Author: George S. MacRae
Publisher: Merlan Scientific Ltd.
Source: 247 Armstrong Avenue, Georgetown, Ontario L7G 4X6
Subject: Science
Topics: Meters, currents in circuits, potential differences
Components: 2 disks & backups, teacher's guide (17p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monochrome monitor
Other Formats Available (not evaluated): Commodore PET/64

Version: 1983
Display Language: English
Cost: $95.00 (1985)
Tel. #: (416) 877-0171
Users: Grade 12

OBJECTIVES

A. METERS - After completing this program students will be able to:

1. Distinguish between series and parallel connections.
2. Wire an ammeter into a circuit to measure the current through some part of the circuit.
3. Wire a voltmeter into a circuit to measure the voltage across some part of the circuit.

B. CURRENT IN CIRCUITS - Given an electrical circuit diagram containing simple series and/or parallel networks of resistors and the current though various parts of the circuit, students will be able to calculate the current through other parts of the circuit.

C. POTENTIAL DIFFERENCE IN CIRCUITS - Given an electric circuit diagram containing simple series and/or parallel networks of resistors and the potential difference across various parts of the circuit, students will be able to calculate the potential difference across other parts of the circuit.

PEDAGOGICAL CONTENT DESCRIPTION

This disk contains three programs:

METERS - This program explains the concepts of series and parallel connections, introduces the electric cell as a power source, illustrates the ammeter as a device which measures electric current, and explains the function and correct wiring of a voltmeter.

CURRENT IN CIRCUITS - The lesson portion of this program reviews the meaning of series circuits and has a student use a simulated ammeter to measure the current leaving the cell in series circuit and then make predictions concerning the value of the current at other locations.

POTENTIAL DIFFERENCES IN CIRCUITS - This lesson begins by studying the potential difference in a simple parallel resistor network. Using a graphic representation of a circuit containing two resistors wired in parallel and connected to a cell, the student measures the potential difference across the cell using a voltmeter and is lead through a series of exercises to discover the rule for resistors connected in series, the potential difference across the entire resistor network is the same as the sum of the potential differences across the individual resistors.

Programs two and three each include an optional drill consisting of ten problem exercises related to the program. A separate test disk contains 15 multiple choice questions based upon the three lessons. Scores, diagnostic information and an optional printout are provided.

PEDAGOGICAL CONTENT EVALUATION

The presentation and development of each concept is logical and well ordered. Animation is used effectively to illustrate textual descriptions and clarify abstract concepts. Range, content and depth are appropriate to the target audience, however three errors in content were noted: 1)The Potential Difference program presents a display of two resistors in series with voltmeters showing voltage drops of 1.5V and 3.0V. Underneath this display the text correctly identifies the total voltage drop as 4.5V, but incorrectly identifies the first voltage drop as 2.5V. 2) The text introducing the test on disk two indicates that 12 questions will be posed; in reality 16 questions are generated. 3) Question #1 of the test incorrectly identifies "b" as the correct response--the answer should be "c".

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of menu selection, page turning, entering single letter answers, or entering short words/phrases to complete a sentence. Questions within each lesson are presented in a fixed order, however review questions to test student understanding are randomized from a limited test bank. Correct answers receive positive textual feedback such as "Great Work" and close answers (e.g. entering a synonym for a word) receive a cautionary message such as "Hold on now". Feedback to incorrect answers informs the student the answer is wrong and the program usually allows a second attempt before presenting the correct answer. If a number of questions are answered incorrectly the program may repeat the instructional material again. Quantitative feedback is provided continually throughout the drills and encourages the student to get a perfect score.

The text diskette gives the user a choice of quantitative feedback after each question or at the end of the test. The user is also given the opportunity of reviewing the questions and is provided with an explanation of the concept that pertains to the questions answered in error. If a printer is available, a hardcopy printout of the student's score and a diagnosis of areas of weakness can be made.

INSTRUCTIONAL FORMAT EVALUATION

The method of moving from the concrete to the abstract via example is instructionally sound. The program allows ample student interaction and the error checking routines for close but incorrect responses is very good. Since the program expects correct calculation of significant digits, students may be advised to have a pocket calculator on hand. Although questions within the tests are effectively randomized, the fixed order of questions within the lesson presentation limits potential reuse of the disk. The quantitative feedback and analysis of error provided during the post-test should enable students to recognize their weak areas and do specific corrective study on these areas. Unfortunately student scores are not saved to disk.

TECHNICAL CHARACTERISTICS DESCRIPTION

High resolution graphics are coupled with combination upper/lower case lettering.

TECHNICAL CHARACTERISTICS EVALUATION

Overall technical design is very good, however the inability to exit a drill until all ten questions are completed may be considered a drawback. The ability to obtain hard copy results of the post-test along with an analysis of areas of weakness is very useful; however, since it is unlikely that each computer in a classroom would be linked to a printer, it would be advantageous to have student scores saved to disk. Displays are well formatted and the use of animation effectively contributes to student understanding. The fact that each lesson loads totally into memory upon initial booting is a program plus.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

Teacher documentation in the form of a 22 page 3-ring binder provides operating instructions, outlines program objectives, and provides an overview of the disk contents.

IMPLEMENTATIONAL SUPPORT EVALUATION

Teacher documentation is well written and easy to use. The program is easy to implement in a classroom and students should be able to work independently with little or no teacher intervention.

SUMMATION

The graphics used in this program greatly enhance student understanding of rather abstract concepts. Helpful feedback, printed quantitative analysis of student learning, and branching for review all contribute to the instructional strength of this package.

STATUS

"Introduction to Circuits" has been designated as a **SUPPLEMENTARY** learning resource for Physics 30.

PURCHASE INFORMATION

This disk is part of a series and may be purchased for $95.00 (1985) from Merlan Scientific Ltd. at the address given at the beginning of the report. The entire series may be purchased for $295.00 It consists of 4 modules: "Basic Concepts"; "Introduction to Circuits"; "Resistance"; and "Electrical Energy". All of these have been authorized as Supplementary resources and reports on them are contained in this document.

Defective diskettes will be replaced without charge within a one year warranty period. Disks which become inoperable through normal use may be replaced for $15.00.

This disk has the advantage of being capable of operation with more than one machine at a time for any particular lesson; however, such use is subject to copyright laws and any license or purchase agreement.

IT'S MATHEMATICS 4

DESCRIPTION

Title: It's Mathematics 4
Authors: Dr. Werner Liedtke and Dr. Walter Muir
Publisher: Gage Publishing Co.
Source: 164 Commander Blvd., Agincourt, ON M1S 3C7
Subjects: Mathematics
Topics: Addition, Subtraction, Multiplication, Division
Components: 2 disks, teacher's guide (55p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, (2nd drive will increase management capacity), monitor
Other Formats Available (not evaluated): Available in Apple Format only

Version: 1984
Display Language: English
Cost: $95.00 (1985)
Tel. #: (416) 293-8141
Users: Grades 1 - 4

OBJECTIVES

This program is designed to assist students in identifying and applying thinking strategies that are useful in solving basic mathematics facts, substituting thinking strategies for concrete and semi-concrete external memory aids, identifying relationships among basic facts, and applying the standard algorithms for addition and subtraction.

PEDAGOGICAL CONTENT DESCRIPTION

The two disks contained in this package provide students with the option of working with basic addition facts (10 modules), subtraction facts (10 modules), multiplication facts (10 modules), division facts (7 modules), addition algorithms (4 modules) or subtraction algorithms (6 modules). Modules within each topic area are sequentially arranged with the last modules serving as a review. Each module begins with an introduction and explanation of the work to be done, incorporates an example and provides drill questions.

PEDAGOGICAL CONTENT EVALUATION

The range of content is generally appropriate. It should be noted that the content covers grades 1 - 4 and could be used by students in those grade levels. The ability to enter the sequence at any point is a positive feature and the program does a good job of illustrating the relationships between numbers through the use of patterns. Transition between modules is not always effective in that some modules tend to present isolated bits of information which do not have a ready link to previous or succeeding modules. Depth is also weak in that there are generally insufficient practice questions to ensure mastery of the concept.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of menu selection, entry of a numerical answer, and pressing the return key and space bar. Questions are randomly selected from a limited data bank. Feedback is given after each step. Positive feedback consists of a check mark and a short phrase such as "Right!" "Well Done!" or "Great!"; Negative feedback depicts a small "x"and a message such as "That's Wrong". This is generally followed by specific hints to encourage the user to think of the pattern that will lead to the correct answer. After two incorrect attempts the correct answer is given. Graphics in the form of square counters are also used to illustrate relationships. Quantitative feedback, given at the end of each module, provides a score and a count of the number of problems requiring a second try. Evaluation at the end of each section provides a final score with no judgmental statement.

INSTRUCTIONAL FORMAT EVALUATION

The instructional technique of using graphics to illustrate relationships is appropriate for the target audience and the corrective feedback provided is effective in achieving the intents of the program. Feedback after every entry is motivating; however, it is also time consuming and, after the completion of a number of modules, it tends to become repetitive. It may be appropriate to include some graphical feedback in keeping with the needs of the younger end of the target audience. The types of control are effective, although it would be advantageous if the teacher could control the number of questions asked via the management system.

TECHNICAL CHARACTERISTICS DESCRIPTION

High resolution graphics are used for concept depictions and for large number portrayal. Sound is used to alert the student that an entry is expected or that an error has been made.

TECHNICAL CHARACTERISTICS EVALUATION

The displays are well suited to the target audience and graphics are effectively used to illustrate such concepts as borrowing and remainders. Some mathematical questions could be more legible if they were better spaced (e.g."3 x 5" rather than "3x5"). Transition between frames is sometimes slow, caused in part by the need to press RETURN to accept an answer and SPACE BAR to activate the next question and in part by the time taken to present the feedback after each question.

The program offers effective internal checks (e.g. it will not accept a 1 digit answer when a 2 digit answer is called for).

IMPLEMENTATIONAL SUPPORT DESCRIPTION

Although no student materials are included, the teacher's manual contains a program overview, outlines objectives and suggests follow-up activities for each module.

A management system is included which provides a screen or hard copy printout of the results of up to 20 students (lessons tried, number right and number tried, number of times help was needed).

IMPLEMENTATIONAL SUPPORT EVALUATION

The management system is easy to use and automatically collects student data and presents comprehensive information on each student. The capacity of 20 students is too small for the average classroom application, however the possibility of engaging a second drive and data disk overcomes this handicap.

It is possible to delete individual student files from a disk, however the user should be warned that there is no "safety net" such as "Are you sure you want to delete this file?"

SUMMATION

The menu-selected modules offer students flexibility in choosing areas most in need of practice. Corrective feedback is effective in offering remediation.

STATUS

"It's Mathematics 4" has been authorized as a **SUPPLEMENTARY** learning resource for Grades 1-4.

PURCHASE INFORMATION

This product may be purchased for $95.00 (1985) from Gage Publishing at the address given at the beginning of the report. Defective diskettes will be replaced free of charge within a 90 day warranty period. There is no warranty beyond that period; however, disks may be purchased individually for $53.00.

Due to the need to access the management system before and after each drill, each disk may be used with only one machine at a time.

THE KING'S RULE

DESCRIPTION

Title: The King's Rule
Author: Thomas C. O'Brien
Publisher: Sunburst Communications
Source: 39 Washington Avenue, Pleasantville, NY 10570
Subject: Mathematics
Topics: Generating and testing hypotheses
Components: 1 disk & backup, teacher's guide (21p.)
System Requirements: Apple II+/IIe/IIc, 48k, disk drive, monochrome monitor
Other Formats Available (not evaluated): Commodore 64, IBM PC, Tandy 1000, TRS-80 III, TRS-80 Color

Version: 1984
Display Language: English
Cost: $59.00 US (1985)
Tel. #: (914) 769-5030
Users : Grade 4 - 9

OBJECTIVES

This program is designed to:

1. Train students to form and test hypotheses.
2. Build skills in recognizing numerical patterns and relationships.
3. Develop skills in critical thinking and problem solving.

CONTENT DESCRIPTION

This program, written in a fantasy game format, allows a student to advance through a castle by successfully generating and testing hypotheses at six levels of difficulty. If the student reaches the throne, (s)he is awarded the crown.

At each level students are shown three numbers which correspond to a secret mathematical rule. Students must generate a hypothesis about the rule and test it by entering their own sets of three numbers which hopefully will comply with the rule. The computer checks that the student entered numbers against the rule, and responds with a "Yes" or "No". When the student feels confident that (s)he knows the rule, (s)he can take a five-question quiz which will test his/her conclusions. The user must solve three consecutive number riddles at each level before being allowed to progress to the next level of difficulty. Descriptions of the program contents of the various levels are available via menu.

There is a teacher section to the program which can be accessed by pressing Control T. This allows for sound to be turned on/off, difficulty levels to be set and viewing of the rules.

CONTENT EVALUATION

The program is well sequenced: Level 1 games deal with small upward/downward jumps from 1-10 inclusive--this is increased to numbers between 1 and 30 by Level 3. Level 4 games introduce linear equations, exponents and absolute values, and Levels 5 and 6 progress to number relationships such as consecutive even numbers, multiples, consecutive multiples, addition of constants, ascending orders, and the idea of a number being divisible by or ending in a specified number. While this sequence does progress from concrete to more abstract principles, the transitional jump between levels 3 and 4 is large.

The fact that students can enter the program at any level coupled with the teacher option of raising or lowering the levels of difficulty allows for good range. Since students can hypothesize about a rule for as long as needed, sufficient depth is assured.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of page turning, alphabetic menu selections and numerical inputs to test hypotheses. Both the "secret" mathematical rules and the supporting examples are randomly drawn from a limited test bank. Textual feedback is given in the form of "yes" or "no" in reply to whether a student's number set follows the secret rule and visual awards, based on the theme of the program, are given if the quiz is completed successfully. Branching routes an unsuccessful quiz taker back for more hypothesis testing.

INSTRUCTIONAL FORMAT EVALUATION

The instructional design of this program is educationally sound. Students have total control of rate, sequence and amount. The questioning and feedback techniques used are appropriate to a drill program, however they are not instructive. Negative feedback is non-threatening and allows the user to re-evaluate answers. Effective branching provides additional hypothesis testing for students who are unable to complete a given test successfully.

At higher levels rules may either be very abstract or very selective. At this point more specific feedback (prompts, hints, etc.) may be appropriate to aid the user in comprehending the rule.

TECHNICAL DESIGN DESCRIPTION

This program uses graphics and color to provide displays of castles, knights, shields, flags, chess pieces and crowns. Sound, which may be teacher disabled, accompanies the feedback to all user responses.

TECHNICAL DESIGN EVALUATION

Displays are well formatted and suitable for the target audience. Text is easy to read and transition within the program is smooth. Colorful and detailed graphics add interest. Ample "work area" is provided on which students can test their hypothesis.

IMPLEMENTATIONAL SUPPORT: DESCRIPTION

A 21 page teacher's guide provides a program overview, objectives, an explanation of difficulty levels, background information on how to play the game, suggestions for using it in the classroom, a list of the rules used in the program, warranty information, etc.

IMPLEMENTATIONAL SUPPORT: EVALUATION

Although this program does not contain any student support materials, the teacher's guide provides a useful program overview and contains good suggestions to aid classroom implementation.

SUMMARY STATEMENT

The game format utilized in this drill and practice disk proves motivating for the intended audience and is effective in developing a student's critical thinking skills. The ability to enter the sequence at any point coupled with the teacher provision of setting the difficulty level enables this disk to be used at a variety of learning levels.

STATUS

"The King's Rule" has been authorized as a **SUPPLEMENTARY** learning resource for Math grades 4 - 9.

PURCHASE INFORMATION

This product may be purchased for $59.00 U.S. (1985) from Sunburst Communications at the address given at the beginning of the report. A lab pack, consisting of 10 diskettes and one set of teacher documentation is available for $177. U.S. (1985). Sunburst Communications offers a lifetime warranty on their courseware products and will replace defective diskettes at no charge.

Due to frequent disk interaction, this disk may be used with only one computer at a time.

LEARNING ABOUT NUMBERS

DESCRIPTION

Title: Learning About Numbers
Authors: Richard Cornelius & Carol Clark
Publisher: C & C Software
Source: 5713 Kentford Circle, Wichita, KS 67220
Subject: Mathematics, Early Childhood
Topics: Counting, telling time, addition, subtraction, multiplication, and division of whole numbers.
Components: 1 disk, user's guide (19p.), keyboard labels, certificate for backup disk
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, color monitor preferred
Other Formats Available (not evaluated): Available in Apple format only

Version: 1983
Display Language: English
Cost: $40.00 U.S. (1985)
Tel. #: (316) 683-6056
Users : Grade 1 - 4

OBJECTIVES

"Learning About Numbers" is designed to provide young children with a variety of experiences in working with numbers including practice in counting, telling time, adding, subtracting, multiplying and dividing whole numbers.

PEDAGOGICAL CONTENT DESCRIPTION

This disk contains three programs:

LET'S COUNT - This program provides practice in numeral recognition and reinforcement of basic counting skills from one to twelve.

LET'S TELL TIME - After presenting the time on a digital watch, this program asks the student to set the hands on a conventional clock to the same time. Sequenced skill levels lead the student through recognition of time on the hour, half hour, quarter hour and finally to five minute intervals. At the highest level the program provides practice with most of the common idiomatic expressions for telling time.

ARITHMETIC FUN - A graphics "story" is used to provide the setting for practice with arithmetic facts. A prince or a princess (the roles alternate) is locked in a dungeon. The student decides either to help a wicked troll capture the prisoner or to help a hero/heroine get the magic key to rescue the victim. One of the characters moves each time, determined by the child's correct or incorrect responses to the arithmetic question presented.

PEDAGOGICAL CONTENT EVALUATION

Content range and depth are both appropriate for the target audience, although very young students with limited reading ability would undoubtedly need initial adult help in disk operation. The user support materials include keyboard stickers designed to provide guidance for the child who is too young to read. Sequencing is excellent. Each arithmetic program has nine increasingly difficult skill levels. Under normal circumstances, each program starts the child at the easiest level and then adjusts the skill level based upon the child's responses. The amount of practice is open ended with the user determining when (s)he wishes to quit the program. On a subsequent run the user continues from the level previously achieved. The disk also provides the option of an adult being able to set various controls on the program including the level at which to begin, the amount of response time allowed, etc.

The accompanying user's guide provides a concise description of each program, a clear outline of the type of questions encountered at each skill level, and a comprehensive explanation of how to access the management system.

INSTRUCTIONAL FORMAT DESCRIPTION

The student inputs his/her name, decides whether or not instructions are necessary, chooses the program to be run, and presses the return or space bar when necessary. Numerical answers are entered for "Let's Count" and "Arithmetic Fun". Left and right arrow keys are used to move the hands of the clock in "Let's Tell Time". Incorrect responses can be erased with the left arrow key before the return key is used to enter the answer.

Questions are randomly selected at each level and those answered incorrectly are subsequently repeated. The teacher has control over the types of questions presented, the number of questions done, the rate of progression and the type of feedback given.

A graphics display accompanied by sound provides feedback in "Arithmetic Fun" and "Let's Count". The word "correct" accompanied with sound rewards positive responses in "Let's Tell Time". The user is automatically advanced to the next level when mastery is achieved and will be moved back to an easier level if too many mistakes are made. Quantitative feedback (the number of questions attempted, the number answered correctly/incorrectly and an evaluative comment on the student's progress) is presented when the student wishes to end a program.

INSTRUCTIONAL FORMAT EVALUATION

Easy-to-follow instructions are optionally available on the disk. While older students should be able to read and follow these independently, younger students would need initial adult intervention. Effective keyboard labels which correspond to the graphic depictions on the screen allow the student to easily identify the correct key to use. Questions are appropriately randomized within the parameters given in each skill level, and animation and sound are both used as feedback messages. Control by both the user and the teacher is effective in these programs.

Since mathematical questions are usually introduced in vertical alignment, younger students may become confused with the horizontal arrangement of questions used in this program. Usually the program allows two incorrect responses and then presents the correct answer. Unfortunately remedial help is generally not provided, except for the counting program which provides a demonstration mode which highlights each object as the corresponding number is displayed at the bottom of the screen.

Used in normal mode, the student has complete control over rate and amount, but with the exception of selecting the program to be tackled, sequence is program controlled. The management system however allows an adult the easy option of adjusting the rate (anywhere from 15 seconds to 1 second per response at the highest level) and the initial difficulty level of each program.

TECHNICAL CHARACTERISTICS DESCRIPTION

Graphics and color are used extensively, upper/lower text is used and sound accompanies all feedback.

TECHNICAL CHARACTERISTICS EVALUATION

This program makes excellent use of color, animated graphics, and sound to interest and motivate the student. Reinforcement is provided in visual form which is appropriate to the target audience. Sound can be adult controlled via the management system as can a number of other features which affect the ease of use of the program. For example, an adult can decide to eliminate the need to have a student type in his/her name if the program is being used with very young children who may not have the necessary spelling or keyboard skills. The program uses high-res graphics for upper/lower case character generation, and standard character generation for numerals. Displays are clear and uncluttered. The student can easily change any answer using the arrow keys, and should reference to instructions be necessary, they can be quickly accessed via the "?" key.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

Using the password "Adult", teachers can access class lists. Utilizing this option, teachers can initiate, maintain and add or delete names. Scores are maintained for individual students which provide the number of runs, the number of questions attempted, and the number of questions answered correctly. These can be viewed on the screen or printed in hard copy form. The teacher may determine the entry level for each student, may choose between two mastery levels and can alter the timing between the parameters from 1 to 15 seconds.

Records are automatically updated each time the student ends a program by pressing the escape key. The program will tolerate a student making a typing error when entering his/her name as the computer attempts to make a correct match with names on the class list and asks a question to confirm that it has the right person. Users who have more than one Kid's Corner program may transfer a class list from one disk to another.

IMPLEMENTATIONAL SUPPORT EVALUATION

"Learning About Numbers" has a comprehensive management system which is very easy to use.

SUMMATION

This program combines excellent technical design with effective sequencing to provide interesting drill routines to aid the student in acquiring basic number fact skills.

STATUS

"Learning About Numbers" has been authorized as a **SUPPLEMENTARY** learning resource for grades 1-4.

PURCHASE INFORMATION

This product may be purchased for $40.00 U.S. (1985) from C&C Software at the address given at the beginning of the report. Defective diskettes will be replaced without charge within a 90 day warranty period. Thereafter, disks may be replaced for $10 upon return of the original disk to C&C Software. Backup disks may also be purchased for $10. Extra sets of keyboard labels may be ordered for $2 each with any other purchase.

This disk has the advantage of being capable of operation on more than one machine at a time provided that only one activity is accessed; however, such use is subject to copyright laws and any license or purchase agreement.

LENSES

DESCRIPTION

Title: Lenses
Author: None cited
Publisher: Heinemann Computers in Education
Source: c/o Gage Publishing Ltd., 164 Commander Blvd, Agincourt, ON M1S 3C7
Subject: Science
Topics: Concave and convex lenses; plane, concave and convex mirrors
Components: 1 disk and backup, manual (27p.)
System Requirements: Apple II+/IIe only, 48K, 1 disk drive, color monitor preferred
Other Formats Available (not evaluated): Available in Apple format only
Alberta Education Call No.: QC 382.2 L573 1982

Version: 1982
Display Language: English
Cost: $85.00 (1985)
Tel. #: (416) 293-8141
Users : Grade 12

OBJECTIVES

This disk is designed to:

1. Supplement the teaching of optics by conventional experiments.
2. Provide the teacher with a convenient method of diagraming the situations involving convex and concave lenses and plane, concave and convex mirrors.
3. Provide quick access to graphs to show the relationship between the variables involved in mirrors and lenses.

PEDAGOGICAL CONTENT DESCRIPTION

This program is a simulation of light incidence on convex and concave lenses and on plane, convex and concave mirrors. The simulation graphically provides answers to the question "What will happen if...?" as it allows the user the option of toggling virtual rays and images, changing the size of the object, lens or mirror, and altering the focal length or the position of the object. (In the case of a plane mirror, changing the slant is also possible.)

Tables giving details of the images (nature, relative and actual size, orientation and image distance) may be superimposed on the diagram. Graphs may also be plotted showing relationships between object and image distances.

PEDAGOGICAL CONTENT EVALUATION

Program content is accurate and offers a good depth of coverage. The range is excellent as all classes of mirrors and lenses are discussed. Optical units may be chosen in any order and almost any combination of parameters may be tested.

The graphing options are more suitable to advanced physics than to high school study; however, they are very interesting and may prove motivating to advanced students as an extension or challenge area of study. Both the format of the teaching guide and the number of keys involved in changing the screens and toggles would suggest that the program is primarily designed for use as a demonstration tool by teachers, and as such it is an effective simulation.

INSTRUCTIONAL FORMAT DESCRIPTION

Student/teacher interaction consists of hitting any one of 32 different keys to activate toggle tables, choose optical units, change parameters, draw/erase rays, toggle the image, present information about the image, or draw graphs. There is no questioning as such in this program. Feedback consists of a change in the screen image to reflect that command activated by a key stroke. Program rate, sequence and amount are all user controlled.

INSTRUCTIONAL FORMAT EVALUATION

This simulation is a comprehensive, accurate, and relatively easy to use program on mirrors and lenses. It is not designed as an individual teaching tool, but has strength more as a teacher demonstration program. The options to investigate several situations for each of the topics provides a convenient tool for instruction; however, the teacher is required to guide students through the demonstration with meaningful examples and discussion.

TECHNICAL CHARACTERISTICS DESCRIPTION

High resolution graphics are used to depict ray diagrams for mirrors and lenses. Color is used but is not mandatory to program operation. Sound is not used. Standard combination upper/lower size text is used and a help screen is available at any point in the program by pressing ESCAPE.

TECHNICAL CHARACTERISTICS EVALUATION

Graphics are clear, well formatted, and easy to follow. The number of key commands needed to gain full use of the program is a little overwhelming in the beginning, but with the guidebook, information page display, and about one-half hour of learning time, the user can become comfortable with them. The program offers excellent flexibility and complete freedom to move back and forth between the available options.

SUMMATION

After students have had some "hands on" lab work with optics, this program provides an excellent means for the teacher to quickly and clearly demonstrate the effects of changes to mirrors and lenses.

STATUS

"Lenses" has been designated as a **SUPPLEMENTARY** learning resource for Physics 30.

PURCHASE INFORMATION

This product may be purchased for $85.00 (1985) from Gage at the address given at the beginning of the report. Damaged diskettes may be replaced free of charge within a 90 day warranty period. Subsequently, damaged disks may be replaced for $52.95.

This disk has the advantage of being capable of operation on more than one machine provided that simulations are restricted to one type of mirror/lens; however, such use is subject to copyright laws and any license or purchase agreement.

LONGITUDINAL WAVE DEMONSTRATOR

DESCRIPTION

Title: Longitudinal Wave Demonstrator
Series: Waves and Vibrations
Author: G. MacRae
Publisher: Merlan Scientific
Source: 247 Armstrong Ave., Georgetown, ON L7G 4X6
Subject: Science
Topics: Single pulses, periodic longitudinal waves
Components: 1 disk and backup, user's guide (1p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monochrome monitor
Other Formats Available (not evaluated): Commodore Pet & 64

Version: 1983
Display Language: English
Cost: $37.00 (1985)
Tel. #: (416) 877 - 0171
Users : Grade 11

OBJECTIVES

The program is designed to provide a visual aid for the instructor in demonstrating longitudinal waves.

PEDAGOGICAL CONTENT DESCRIPTION

The program supplies three animated graphic displays - single pulses, continuous wave and two continuous waves in a spring. The user may alter the speed of the wave, select freeze motion or highlight a single coil of the spring to display its motion.

PEDAGOGICAL CONTENT EVALUATION

The displays for single pulse and a continuous wave are very well done but unfortunately the display of the two continuous waves is quite weak. The spring carrying the two continuous waves is not clearly shown and the illusion is given that the spring is twice the size and is broken in two so that each side operates independently of the other side. The spring can appear out of phase with itself.

INSTRUCTIONAL FORMAT EVALUATION

The program is designed as a demonstration and as a result there is no instructional design.

TECHNICAL CHARACTERISTICS DESCRIPTION

High resolution graphics are used to display the spring and the movement of the wave in the spring. A high resolution generated character set is employed to present text.

TECHNICAL CHARACTERISTICS EVALUATION

The displays are clear and concise and are directed toward one concept at a time. The demonstration of the two continuous waves has distracting flaws and is of questionable use.

SUMMATION

The disk does show the wave pulses and continuous wave reasonably well and these are a good use of the computer medium. However, the value of the third demonstration is questionable and due to the limited content presented, the usefulness of the entire disk is affected.

The disk does not have an instructional component and, as such, it would not generally fall within our search area. That and the unsuitability of one third of the content would normally result in the product being rejected. However, the disk is part of a series which, in its entirety, is quite good. This disk is the only weak part. While we would not recommend that this demonstration be purchased on its own, it may serve a purpose within the larger context of the full series. As the series price is well below the sum of the individual disk prices, it would not be overly disadvantageous to purchase the demonstration as part of the full series.

STATUS

"Longitudinal Wave Demonstrator" has been designated as a **SUPPLEMENTARY** learning resource for Physics 20.

PURCHASE INFORMATION

This disk is part of a series and may be purchased for $37.00 (1985) from Merlan Scientific Ltd. at the address given at the beginning of the report. The entire series may be purchased for $150.00 It consists of 6 modules: "Periodic Motion"; "Waves in a Linear Medium - Introduction"; "Waves in a Linear Medium - Superposition"; "Periodic Waves - Basic Concepts"; "Longitudinal Wave Demonstrator"; and "Wave Demonstrations". All of these have been authorized as Supplementary resources and reports on them are contained in this document.

Defective diskettes will be replaced without charge within a one year warranty period. Disks which become inoperable through normal use may be replaced for $15.00.

This disk has the advantage of being capable of operation with more than one machine at a time; however, such use is subject to copyright laws and any license or purchase agreement.

MAGIC SPELLS

DESCRIPTION

Title: Magic Spells
Author(s): Leslie Grimm
Publisher: The Learning Company
Source: C/O Addison Wesley, P.O. Box 580, 26 Prince Andrew Place, Don Mills ON M3C 2T8
Subject: Language Arts
Topics: Unscrambling words, spelling practice
Components: 1 disk and back-up, teacher's guide (50p.), activity sheets (44p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, colour monitor preferred
Other Formats Available (not evaluated): IBM PC/PCjr, Commodore 64, Atari

Version: 1985
Display Language: English
Cost: 81.56 (1985)
Tel. #: (416) 447-5101
Users: Grades 2 - 6

NOTE:

"Magic Spells" is available in a home edition from The Learning Company as well as a school edition from Addison Wesley. The packages are identical in terms of disk content but vary in what is included with the package.

The Learning Company version costs $40 U.S. (approximately), includes one disk and has a 32 page guide (small pages) which explains the games and the teacher utility function.

The Addison Wesley version costs $80.00 (approximately), includes the disk as well as a back-up disk and contains 94 pages (regular size) of support. This documentation contains 50 pages of explanations as well as 44 pages of student activity sheets.

Descriptive and evaluative comments contained in the report are based on the Addison Wesley version.

OBJECTIVES

This program is designed to develop spelling skills. The stated specific objectives of "Scramble Spells" are spelling practice, letter matching and sequencing, and working with part to whole relationships. "Flash Spells" provides spelling drills, practice in focusing attention, increasing speed in word recognition and visual memory skills.

PEDAGOGICAL CONTENT DESCRIPTION

"Magic Spells" uses a game format designed around a fantasy theme of castles, demons and unicorns to provide spelling drill and practice. The program consists of two parts: two student games ("Scramble Spells" and "Flash Spells"); and "Spells Writer" which is an authoring utility for teachers to create word files for the student games. In "Scramble Spells", students practice spelling words by unscrambling letters of words presented randomly from a current spelling list. Since all the letters of the word appear on the screen, the students can compare the letters they see with the letters they use to spell the word. In "Flash Spells", the students see a word flashed on the screen for one to nine seconds and then they must correctly type that word. This game is intended to provide practice in focusing attention, increasing word recognition speed and developing visual memory. In both games, the students are allowed to choose a spelling list from a games option menu and a statement of rules is available for each game. There are fourteen lists varying from six to twenty words composed of up to fifteen letters each. The "Spells Writer" allows the teacher or student to create and save spelling lists on the disk.

PEDAGOGICAL CONTENT EVALUATION

The range, sequence and depth of content are limited in the prepared lists which are provided and are inadequate for the full indicated target audience; however, the teacher utility can be used to eliminate this problem by deleting the prepared spelling lists and replacing them with lists that would proceed sequentially in difficulty for a specific grade level. It is noted that students in grades one and two will likely experience difficulty reading the instructions and will require teacher assistance. The accuracy of the spelling words when the "Spells Writer" is used depends entirely on the inputting. If students are entering word lists, it is important that these be checked for accuracy.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of menu selection, unscrambling words or spelling words by inputting the correct letters, using special keys to exit, capitalize, erase, and see the correct answer. Once the student has made the selection, a list of words appears for the student to study as long as is desired. The student is encouraged to copy the list. The words are then presented in random order.

Graphic and optional audio feedback are provided. At the beginning of a game, closed treasure chests corresponding to the number of words in the game, appear at the top of the screen. A correctly spelled word on the first try results in the student receiving two points for each letter in the word, the lid of a chest opens and is filled with gold and music is provided. If the student needs more tries to successfully spell the word, the points and gold are shared with a demon (opponent). If the word is incorrect, a prompt appears below the word showing the correct placement of some of the letters and a question is placed by incorrect letters. The student may access help by using the shift and asterisk keys, but forfeits all points to the demon for that spelling word. At the end of a game, one of three screens appears: a unicorn if all words were spelled correctly; a rainbow and a pot of gold if one or two words were misspelled on the first try; a treasure room if three or more words were misspelled on the first try. Each graphic is accompanied by audio tones. Scores are displayed during the game and the student's and demon's total scores are given at the conclusion of the game. No evaluative techniques or branching is provided in this program; however, there are additional activities provided in the documentation which may be used for evaluative purposes.

INSTRUCTIONAL FORMAT EVALUATION

Student interaction is appropriate for most of the target audience; however, grade one students will likely require extra assistance. Young students may also have some difficulty entering capital letters. The scoring procedure is not clearly explained on the disk and will require some teacher explanation. The utility program can be used to challenge the more able spellers by having them prepare lists of words. Although the questioning techniques are appropriate for the program, some teachers may question the use of the unscrambling procedure and the lack of context for young children.

Feedback is immediate and generally appropriate; however, the feedback provided at the end of each program becomes repetitive, time consuming and may become boring with re-use. Although the graphics are interesting, perhaps more variety could be included. No provision is made for reviewing words which caused difficulty; this would be valuable for students who are having problems. It would be useful to have included tests to measure student progress; however, teacher made tests can be used.

TECHNICAL CHARACTERISTICS DESCRIPTION

The character size is larger than normal and provides both upper and lower case print. Colour, graphics and sound are used with sound being optional. Flashing and highlighting are used to draw attention to letters or words.

TECHNICAL CHARACTERISTICS EVALUATION

The displays are clear and uncluttered. The text is large enough to be read very easily; however, there were occasions when shadows of words were apparent when the screens changed. Since colour is used throughout the program, a colour monitor is preferred but the program may also be used with a monochrome monitor. The graphics added to the fantasy element and were appropriate for the age group but more variety would be beneficial. The optional use of sound is a good feature for use of the program in the classroom. The use of CONTROL-A for capitalization is awkward and confusing for the younger users. It was noted that if a student types too quickly, errors will result in that the letters are not accepted as quickly. The program is reliable, easy to use and appears to be bomb-proof.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

No special entry competencies are indicated. No regular management system is included; however, "Spells Writer", a teacher authoring utility, is provided. It allows the teacher to enter a new list, delete a word or a complete list, view the lists, copy the list of words using the printer and store all new words on a disk. The teacher can create a maximum of thirty lists consisting of one to twenty words with a maximum of fifteen letters per word.

The teacher's guide (Addison Wesley) provides an introduction to teaching with computers and classroom management; detailed descriptions of the games with specific suggestions for use in the classroom; information on how to use "Spells Writer" to author, store, and retrieve spelling lists; and reduced copies of the student activity pages and suggestions for their use in conjunction with the regular classroom spelling program. Some of the activities involve a spelling activities book that students can use to keep their work, record their scores and keep track of the progress while other activities include games, practice and enrichment.

The user support materials (Addison Wesley) include thirty-nine activity sheets consisting of lists for spelling words and tests, spelling enrichment activity pages which include word games and puzzles, and extra skill activities that include dictionary skills, alphabetizing, homonyms, antonyms and synonyms, etc. Record sheets are also included.

IMPLEMENTATIONAL SUPPORT EVALUATION

Although no specific competencies were indicated, an orientation for use of the program, including the use of capital letters will be needed, especially for the grade one and two students.

The teacher authoring system is easy to use but does not monitor student progress and does not collect data. The lack of a security system may be a problem since the students can access the "Spells Writer" and could delete files or add new lists when not desired by the teacher. It is noted that there is no warning built into the delete function; a typing error and a return could delete the wrong file. The print out function is an advantage in order to provide copies.

The teacher's guide is well organized and easy to use. The user support materials provide a wide range of additional activities to enhance the use of this program within a classroom setting by providing both reinforcement and enrichment. This program should require only minimal teacher computer competency to be used for a variety of classroom uses. Students should have little difficulty using the program but the primary students will require some initial assistance.

SUMMATION

This program can be used effectively in the language arts program if the teacher uses the utility program to create spelling lists which will have appropriate sequential development and depth. The documentation is clear, comprehensive and easy to follow. The student support materials help to enhance the program and provide activities that are interesting and helpful in the classroom.

Drawbacks to the program are: No provision is made for students to review words that caused difficulties; no quantitative data is provided for the teacher; no management system is provided to keep track of student progress; some of the feedback lacks variety, especially when the program is used a great deal; words are not presented in context; no security is provided on the teacher utility. In spite of these weaknesses, however, the ease with which the program can be adopted, the strong support materials and the price are positive features warranting consideration for use in schools.

STATUS

"Magic Spells" has been authorized as a **SUPPLEMENTARY** learning resource for grades 2 - 6.

PURCHASE INFORMATION

This product may be purchased in a number of configurations. The Learning Company (545 Middlefield Road, Suite 170, Menlo Park, California, 94025) provides a single disk package for $39.95 U.S. (1986). In addition, they provide a "lab pack" of five disks for $60 U.S. (1986). Defective diskettes will be replaced without charge within a 90 day warranty period. Disks which are damaged by the user will be replaced for $10.00 U.S. upon return of the damaged diskette. This includes diskettes which wear out through normal wear and tear. There is no time limit for this warranty.

The educational package may be purchased for $81.56 from Addison Wesley at the address given at the beginning of the report. Note that this package contains two copies of the disk as well as extensive documentation. A similar warranty package is also available.

This diskette has the advantage of being capable of operation with more than one machine at a time provided that only one spelling list is accessed; however, such use is subject to copyright laws and any license or purchase agreement.

MASTERTYPE

DESCRIPTION

Title: MasterType
Author(s): Bruce Zweig
Publisher: Scarborough Systems Inc
Source: 55 South Broadway, Tarrytown, NY 10591
Subjects: Computer Literacy
Topics: Typing instructions, finger positioning exercises, sentence practice
Components: 2 disks, user's guide (46p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monitor
Other Formats Available (not evaluated): Macintosh, IBM PC/PCjr, Atari, Commodore 64

Version: 1984
Display Language: English
Cost: $39.95 US (1985)
Tel. #: (914) 332-4545
Users: Grades 4 - 9

OBJECTIVES

The objectives of this program are for the user to:

1. Learn correct fingering and positioning for touch keyboarding using the home row keys as a base.
2. Learn to type quickly and accurately.

PEDAGOGICAL CONTENT DESCRIPTION

This package contains both a training disk and a game disk. The training disk offers four menu choices:

1. Mastertype Fingering Chart--Given an illustration of the keyboard with fingers placed in home row position, students can hit any key and have the proper fingering technique illustrated.

2. Timed Finger Practice--Students progress through eight lessons and receive practice typing single letters, beginning with the home row keys and then progressing to the upper and lower row keys, including punctuation keys. This section culminates with 2, 3, and 4 letter combinations randomly using all keys on the keyboard.

3. Word and Sentence Practice--The six lessons in this section offer speed and accuracy practice at a choice of three speeds: slow, medium, or fast. Each lesson contains forty words/phrases for practice and teachers are offered the option of entering words of their own choosing.

4. Mastertype Training Game--Developed as a training ground for disk two, this game encourages students to type the words shown at the four corners of the screen before they advance to the center and are "blown up".

Disk two, the Mastertype Game, allows users a choice of four modes: beginner, cadet, commander, and continuous demo. The object of the game is to shoot down four words (approaching from the four corners of the screen) by typing them in correctly before they destroy the user's spaceship. Each word is replaced by a new word as it is shot and thus the game progresses until all forty words are destroyed or until the spaceship is hit twice from the same word direction. Words which are entered quickly and accurately are "destroyed" and do not reappear; however, students will gain additional practice on problem words as words which are not destroyed will reappear.

PEDAGOGICAL CONTENT EVALUATION

The range, sequence and depth are best suited to an elementary and/or junior high audience, although they may have limited application at the high school level. Provided students work through all of the the training disk lessons in numerical order and move on only when they have mastered the lesson at the required speed level, the objectives of the program will be met.

Content is well sequenced within the lessons and a choice of playing modes provides incremented levels of playing difficulty within the game.

Content depth is well designed to provide extra practice on words which the user finds difficult.

A content error was noted in the chart depiction of proper fingering techniques--the number 6 key should be controlled by the "j" finger, not the "f" finger as illustrated.

The option of teacher input of self-created word lists together with accompanying explanatory text adds a great deal of flexibility and unlimited content to the program.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of use of all alpha/numeric keys, punctuation keys, and the return, spacebar, delete and escape keys. Each game is divided into four waves, thus providing an opportunity for students to review their progress. Audio, visual and textual feedback are provided. On the training disk, the words typed per minute together with the error count are flashed immediately upon completion of an entry. If 100% accuracy is attained, a congratulatory phrase is flashed and students are automatically advanced in the program; if errors are made, a "wizard" highlights incorrect entries with his wand and students are asked to "try again" until they can type each of the four words correctly. The Mastertype game awards points for correct entries and deducts points for errors.

Users select the lesson sequence from a main menu. however once into a lesson: both sequence and amount are program controlled. Students have total control over the rate in the lessons and can choose from three speed levels in the game. (The range of speed levels can be altered at the user s discretion).

INSTRUCTIONAL FORMAT EVALUATION

The student interaction is appropriate for an elementary and/or junior high environment. Teacher monitoring is required to ensure that students are using the proper touch typing techniques, are completing lessons in the appropriate sequence, and are demonstrating proper posture. Unfortunately the disk menu does not provide an explanation of lesson contents--users must depend upon the manual in order to select the appropriate lesson for practice. The feedback given after each entry is appropriate, but users must be cautioned that the speed they attain in typing very short words/phrases will likely be considerably higher than what they will attain on one minute timings.

TECHNICAL CHARACTERISTICS DESCRIPTION

Within the lessons, text is presented in standard size upper and lower case print. Within the game, text may be entered in either upper or lower case but not both. High resolution colored graphics are used to illustrate the keyboard and proper finger controls. Sound, which can be disabled, is used both for positive and negative feedback as well as for special effects in the game. Users have the option of exiting from any lesson or game prior to completion.

TECHNICAL CHARACTERISTICS EVALUATION

This program offers a number of technical strengths: it is available for a wide variety of computer types; it is adaptable for use with one or two disk drives and with the QWERTY or DVORAK keyboards; it can be run equally successfully on a monochrome or color monitor; each lesson loads completely upon initial boot; and, sound can be disabled.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

A 46 page user's guide contains program operating instructions for both disks, outlines rules for the game, give an overview of content scope and sequence, and provides program descriptions. Teachers have the option of inputting word lists of their own choosing.

IMPLEMENTATIONAL SUPPORT EVALUATION

The documentation provides adequate information to enable easy classroom implementation. The program may be used by a student with a minimum of computer competency. It would be advantageous if students were provided with a copy of the contents of each lesson as this is not defined on the disk.

While the option of inputting teacher defined word lists is a nice extra, the full 40 words allowed per lesson MUST be entered and the individual word length is limited to nine characters. The method of deleting unwanted word lists is not adequately explained.

Unfortunately a management system is not available.

SUMMATION

While not designed as a primary keyboarding instructional tool, this program may have merit for use in a beginning keyboarding class as a break from the monotony of learning the keyboard as it provides a "game" approach to a tedious task. The ease with which good speed and accuracy rates can be attained on short words/phrases may build motivation for longer, sustained classroom drills.

STATUS

"Mastertype" has been authorized as a **SUPPLEMENTARY** learning resource for Elementary and Junior High Computer Literacy courses.

PURCHASE INFORMATION

This product may be purchased for $39.95 U.S. (1985) from Scarborough Systems at the address given at the beginning of the report. Defective diskettes will be replaced free of charge within a 30 day warranty period. Thereafter, damaged disks may be replaced for a $5.00 charge.

This diskette has the advantage of being capable of operation with more than one machine at a time; however, such use is subject to copyright laws and any license or purchase agreement.

MATH ACTIVITIES COURSEWARE 3
MATH ACTIVITIES COURSEWARE 4
MATH ACTIVITIES COURSEWARE 5
MATH ACTIVITIES COURSEWARE 6
MATH ACTIVITIES COURSEWARE 7

DESCRIPTION

Titles: Math Activities Courseware (MAC) 3, 4, 5, 6, 7
Author: Doug Super
Publisher: Houghton Mifflin Canada Ltd.
Source: 150 Steelcase Road West, Markham, Ontario, L3R 1B2
Subject: Mathematics
Topics: MAC 3: Whole numbers & decimals; estimation; problem solving; telling time; congruency
MAC 4: Whole numbers, decimals & fractions; estimation; problem solving; area; congruency; making change
MAC 5: Whole numbers, decimals & fractions; estimation; problem solving; rounding; area & perimeter, time
MAC 6: Whole numbers, decimals & fractions; estimation; problem solving; metrics; time
MAC 7: Whole numbers, decimals & fractions; estimation; problem solving; flow charts; LOGO
Components: Each volume has 3 diskettes & backups, teacher's guide, worksheet & suggested activities
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, color monitor desirable
IBM PC family, 96K, graphics card, color monitor desirable
Other Formats Available (not evaluated): Commodore 64
Alberta Education Call No.: QA 107 H838 v3c (v4c, v5c, v6c, v7c) 1983

Versions: 1983 - 85
Display Language: English
Cost: $225-$250 each (1985)
Tel. #: (416) 475-1755
Users : Grades 3,4,5,6,7

OBJECTIVES

This courseware series is designed to engage students in active experiences involving estimation, problem solving strategies and concept development in operations with whole numbers, decimals and fractions.

PEDAGOGICAL CONTENT DESCRIPTION

Each grade level in the MAC series contains 15 programs designed in a game mode. Each of the activities is intended to meet certain objectives related to a central concept from one of the units in the corresponding Houghton Mifflin Mathematics textbook. The courseware is intended to supplement the textbook and not to stand alone.

The games are designed so that individuals or groups may play against the computer or against each other. Many of the activities are open ended thus permitting involvement at varying levels of sophistication. In addition, interaction within a group in the determination of appropriate strategies is encouraged.

PEDAGOGICAL CONTENT EVALUATION

The content range, sequence, depth and level of difficulty of this series are generally appropriate to the Alberta curriculum. In each package, there are some programs whose content treatment or whose problem solving strategies may prove to be too challenging for some students; however, these could be used appropriately for enrichment. As such, content in the packages above and below the target grade could be reviewed for possible use within any one grade level.

The content is current and metricated. The programs strengthen problem solving strategies, estimation and basic skills development in an interesting and appealing manner.

The courseware is specifically designed to support the Houghton Mifflin math textbook series but they could be used with any series provided that the suggested lead-up activities are employed. When used in combination with classroom instruction and in conjunction with the support materials provided, this courseware fulfills its stated objectives admirably.

INSTRUCTIONAL FORMAT DESCRIPTION

Interaction with the computer consists of menu selections, the designation of the number of players as well as a variety of answer inputs including numerical values, letter values, arrow keys and "+", "-" and space bar keys. Inappropriate keys are frozen. Interaction within the group in discussing strategies can be productive and is encouraged.

Questions are generated randomly. Feedback techniques vary from one program to another but almost all are presented graphically with the use of sound. Examples of feedback include clues as to how close one is to the answer, an accuracy comparison of an estimation, elimination or addition of obstacles, awarding of points, ending of turns, etc. Graphical positive feedback motivates the student to get the answer correct.

INSTRUCTIONAL FORMAT EVALUATION

Interaction is consistent and readability is appropriate to the target audience. Game structure is both unique and imaginative and effectively reinforces classroom teaching. A few of the games are timed - this serves to heighten student motivation and interest and to quicken response time. Students can compete with the computer or with other students and are encouraged to watch the responses of their opponent attentively in order to plan effective strategy for their next move.

The non-threatening and immediate feedback is very appropriate. Graphics, text and sound are all used to advantage. However, it should be noted that no help or explanation is given for incorrect answers. Students having difficulty with the concept or with the strategies involved may find certain games frustrating. In addition, as explanations on the disk on how to play the games are missing on many of the packages, students who are playing a game for the first time may also be frustrated. Prior introduction to each activity by the teacher is recommended.

TECHNICAL CHARACTERISTICS DESCRIPTION

Graphics are an essential component of the programs. Color is also used but a color monitor is not essential. Sound is optional and is controlled by the teacher.

TECHNICAL CHARACTERISTICS EVALUATION

Technical design is excellent. Displays are appropriate and effective, text is clear and easy to read, and transition from one display to the next is smooth. Optional sound complements each program. The use of both standard size text for general comments and large size text for important numbers or concepts adds effective emphasis. The program is well bomb-proofed in that all keys unnecessary to game operation have been disabled.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

A teacher management system enables teachers to use/disable sound and to control student program selection. The instructor's guide contains student worksheets, provides program operating instructions, suggests alternate classroom activities, and outlines specific objectives for each program.

IMPLEMENTATIONAL SUPPORT EVALUATION

The management system is easy to access and use. Documentation is well organized and following its guidelines results in easy implementation. The worksheets are closely linked with the computer programs and provide a good record of student progress.

SUMMATION

The major strengths of this series are its stress on the development of problem solving strategies, logical thinking and estimation. The game approach and the effective use of graphics and sound keep the user interested and motivated. This is an excellent series.

Teachers will have to assist students having difficulty as only limited feedback is provided and some problem solving activities may be too challenging to weaker students.

APPLE - IBM VERSIONS

This report has been based on an evaluation of the Apple versions. The IBM versions require the one-time transfer of DOS 1.1, 2.0 or 2.1. Program content and quality of the two formats are virtually identical.

STATUS

The Apple and IBM versions of "Math Activities Courseware 3, 4, 5, 6 and 7" have been designated as **RECOMMENDED** learning resources for grades 3 - 7.

PURCHASE INFORMATION

Alberta schools may purchase these products from the School Book Branch for a special price in the neighborhood of $150 per level (1985). Note that MAC 7 will be approximately $20 more expensive. Defective diskettes will be replaced without charge within a 30 day warranty period. Note that the package contains backup diskettes. Diskettes which become inoperable through normal use may be returned to the S.B.B. and replaced for approximately $28 (1985). There is no time limit for this warranty.

Each diskette has the advantage of being capable of operation with more than one machine at a time if only one activity is accessed; however such use is subject to copyright laws and any license or purchase agreement.

MATH BLASTER

DESCRIPTION

Title: Math Blaster
Version: 1982
Publisher: Davidson & Associates
Cost: $49.95 U.S. (1984)
Source: #12, 6069 Groveoak Place, Rancho Palos Verdes, CA 90274
Tel. #: (213) 373-9473
Subject: Mathematics
Users : Elementary
Topics: Whole number operations, reducing fractions, fraction/decimal/percent equivalency.
Components: 1 program disk, data disk, user's guide (63p.)
System Requirements: Apple II+/IIe/IIc; 48K; 1 disk drive; color monitor preferred
Other Formats Available (not evaluated): IBM, Commodore 64
Alberta Education Call No.: QA 95 E19 1983

OBJECTIVES

This program is designed to:

1. Help students memorize math facts.
2. Improve accuracy and increase speed of recall of basic number facts.
3. Build math skills in an interesting, entertaining and effective way.

PEDAGOGICAL CONTENT DESCRIPTION

The five programs contained on this disk provide drill and practice in addition, subtraction, multiplication and division of basic facts and in fraction/decimal/percent equivalency. Each operation is subdivided into five levels of difficulty, and each set can be studied by any of four activities: demonstration, two drill and practice routines, or a game. Sums range from 1 to 25, minuends from 8 to 20, multiplication facts from 1 x 1 to 12 x 12, and divisors range from 1 - 12. A fifth group includes reducing fractions and renaming fractions as decimals, decimals as percents, and percents as fractions.

The accompanying teacher's guide clearly outlines program operation and use of the editor function as well as providing an appendix listing of all math questions contained on the program.

PEDAGOGICAL CONTENT EVALUATION

The content is accurate and clear and is appropriate for the target audience. The sequencing is also good: all facts are grouped by difficulty, and generally four of the five levels cover the basics while the fifth level offers more challenging facts. The program contains sufficient examples, illustrations, and practice and the option of horizontal or vertical question arrangement is a positive feature.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of entering one's name, using/disabling sound, selecting the drill area, selecting the level, choosing one of four activities and choosing between horizontal, vertical or mixed arrangement of questions. The student is given two seconds to verbally express the answer in the tutorial section before the computer generates the answer on the screen. Other numerical answers are entered in left to right form. Student interaction in the game consists of using the arrow keys to move a "man" to the location of the correct answer and using the "Z" key to shoot.

Questions are randomly generated from a limited test bank. (Teachers can create additional data files if they wish.) Correct responses in the drill programs are rewarded with one of four positive comments. After 10 correct answers an animated picture with sound effects is given as a reward. An incorrect answer produces the message "Try again" and the correct answer is presented after a second incorrect response. Upon completion of the drill (or upon pressing ESCAPE), the user is given his/her elapsed time, the number of questions answered correctly, the total number of questions attempted, and the percentage score. The student is then given the option of attempting the missed questions a second time.

INSTRUCTIONAL FORMAT EVALUATION

Questions are randomly selected from a limited test bank. Feedback is immediate: a positive textual comment accompanied by optional sound is given after a correct answer, while the message "try again" is given for incorrect answers. The instructional technique used can be described as an "electronic flashcard" method in that students are given the correct answer after the second attempt and no explanation of wrong answers is given as students are expected to have the number facts memorized. Unfortunately the program does not distinguish between a right answer and the wrong format (e.g. 70/100 = .70 but .7 says "Try again").

The emphasis in the Math Blaster video game section of the program is on speed and not on question difficulty. Because of this there are few discriminating answers and the user may guess rather effectively. The multiple choice answers are too obvious, thus students may guess at the answer without really understanding the concept being taught. Similarly unnecessary clues are given in the fraction/decimal units in that blank lines are given to indicate the number of digits in the answer.

Although there are no help sections associated with the lessons, the student is given the opportunity to review questions (s)he missed. Since there is no teacher control of sequence, instructors will have to closely monitor student work levels to ensure they are choosing levels appropriate with their skill.

The inclusion of a teacher editor which allows the instructor to create his/her own file of questions is a positive feature.

It is unfortunate that the teacher is not given computer control of the activity chosen, as when students have free choice, many will choose the game which is the least efficient teaching program. One also questions the value of the "Look and Learn" section as there is no way to ensure that students are attempting to answer the question orally before the answer is generated on the screen.

TECHNICAL CHARACTERISTICS DESCRIPTION

Colored graphics are used as positive reinforcement and as a basis for the game. Sound, which can be user disabled, is used as part of the positive reinforcement.

TECHNICAL CHARACTERISTICS EVALUATION

All displays are error-free, concise, and use appropriate large lettering. Graphics are rapidly generated, sound is optional, and use of a color monitor is not mandatory.

SUMMATION

This program is a "flashcard" method of teaching basic math facts and as such offers drill and practice but does not include instruction. It could be appropriately used as a motivational drill and review for students who lack confidence with basic number facts. The lack of a management system means that teachers must closely monitor student progress in order to ensure they are working at a level suitable to their ability.

STATUS

"Math Blaster" has been designated as a **SUPPLEMENTARY** learning resource for elementary grades.

PURCHASE INFORMATION

This product may be purchased for $49.95 U.S. (1984) from Davidson & Associates at the address given at the beginning of the report. Defective diskettes will be replaced without charge within a warranty period of one year provided that the disk is returned and that a valid warranty card is on file. Data diskettes are copyable by teachers. Each program purchase entitles the owner to purchase one backup program disk for $10.00.

This program has the advantage that it is capable of operation with more than one machine after the program has been loaded and provided that drill activities are restricted to the same file; however, such use is subject to copyright laws and any license or purchase agreement.

MATHEMATICS: LEVEL A (Unmanaged)
MATHEMATICS: LEVEL B (Unmanaged)
MATHEMATICS: LEVEL C (Unmanaged)
MATHEMATICS: LEVEL D (Unmanaged)

DESCRIPTION

Title: Mathematics: Levels A, B, C and D (Unmanaged versions)
Authors: Science Research Associates & WICAT Inc.
Publisher: Science Research Associates (Canada) Ltd.
Source: 707 Gordon Baker Road, Willowdale, Ontario, M2H 2S6
Subject: Mathematics

Version: 1981/83
Display Language: English
Cost: $295,$525,$665,$665 (1986)
Tel. #: (416) 497-7707
Users : Grades 1 - 9

Topics: Fundamental operations with whole numbers, decimals, fractions, percents, measurement, pre-algebra
Components: Teacher's guide with each level and program diskettes as follows: A = 4, B = 8, C = 11 & D = 10
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monochrome monitor
Other Formats Available (not evaluated): Available in Apple format only
Alberta Education Call No.: QA 135.5 S416m LA (LB, LC & LD) 1981

OBJECTIVES

To provide drill and practice in major arithmetic skills for grades 1 - 9.

PEDAGOGICAL CONTENT DESCRIPTION

Each of these levels provides drill and practice in arithmetic skills as follows:

Level A (for grades 1 - 2): counting, writing numerals, comparing numbers, addition and subtraction of whole numbers.

Level B (for grades 3 - 4): writing numerals, place value, whole number operations (addition, subtraction, multiplication and division), operations with fractions.

Level C (for grades 5 - 6): operations with whole numbers, fractions and decimals.

Level D (for grades 7 - 9): operations with whole numbers, fractions & decimals, measurement, pre-algebra, numbers & numeration, ratio & percent, applications.

Each of the units is developmental and ranges from the introduction of a concept to the highest operation within that content area. Throughout the series, four to twenty questions are presented in a practice session. No instruction is provided but the student has the option of requesting "help" in the form of a tutorial at any part of the program.

PEDAGOGICAL CONTENT EVALUATION

This series provides excellent drill and practice. The scope and sequence are well planned and, as the content is very finely sequenced, most students will be able to proceed with success.

Students may have unlimited amount of practice and 'help'. This help includes definitions, examples and step by step solutions and is accessed whenever the student desires it. The help session may be inappropriate for students who are very weak in the skill or have poor reading ability. This should not, however, be a problem if the sequence is followed properly or if the teacher monitors student progress regularly.

SI metric is not followed completely. Some numbers have commas, "meter" is spelled as 'metre' and imperial units are used extensively in the measurement and applications disks. The applications disk is further weakened due to Americanization of the content.

Generally speaking and considering the scope of the series, the content development is excellent.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of entering numerical answers in parts or in their entirety, answering multiple choice questions, moving the cursor and/or requesting help. Students are given one attempt at the randomly generated questions.

Feedback is given by happy faces or X's in boxes at the bottom of the screen. The boxes also indicate the number of questions in the drill. An "OK" and an optional audio "beep" also appear with correct responses, while a "NO" appears with errors. To see the correct answer students have to access the 'help' branch. Quantitative results and a recommendation on future work appear at the end of each drill.

INSTRUCTIONAL FORMAT EVALUATION

The instructional design of this package is sound. Interaction with students is effective, particularly as the student can work out most questions on the screen and the keyboard is frozen to guard against accidental input. The value of the 'help' session is considerably increased through the high degree of student interaction.

The feedback is consistent, relevant and immediate although limited in variety. Unfortunately students are given only one chance at responding to a question and the correct answer is shown only if the 'help' session is accessed. This could be frustrating to students who want only to see the answer or it could be a problem if weak students do not elect to see the help. It may be more appropriate to show the correct answer after mistakes and to automatically send the student to the tutorial after x number of errors. The provision of this branch, however, is an excellent addition to a drill program.

Questions are randomized effectively although successfully answered questions occasionally can reappear.

TECHNICAL CHARACTERISTICS DESCRIPTION

Text and numbers are generated in large size, upper and lower case high resolution graphics. An audio "beep" is optional, special features such as animation and inverse mode are present in some tutorials and high resolution graphics are used to show tables and grids, occasionally with color.

TECHNICAL CHARACTERISTICS EVALUATION

The package is well designed. Numbers and letters are large and easy to read and the program, with the exception of the generation of some of the detailed graphics, moves along at an adequate pace. It may be appropriate to keep pertinent graphics on the screen, e.g. square root tables, rather than clearing and then redrawing. Although the programs are generally friendly, reliable and consistent, some instruction to students is required regarding the special function of some keys.

While student motivation may not be a problem due to the high probability of success in the drills, the slow speed of some programs and the similarity to a series of printed drill sheets may deter some students. There are few if any motivational tools used and this is one area that some evalutors felt could be improved upon. Other evaluators felt that brief daily sessions would not lead to boredom and 'frills' were unneeded.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

This product is available in both a managed and unmanaged version. In the authorized, unmanaged version, records on student progress must be kept on paper. Selection of lessons is done by the teacher and/or the student.

The teacher guide consists of instructions on how to use the program as well as a complete scope and sequence chart.

IMPLEMENTATIONAL SUPPORT EVALUATION

The documentation provided with the product is sufficiently detailed to allow the teacher to make good use of the materials.

SUMMATION

Diskettes in these four levels will vary slightly in quality and some teachers may find the approach used to practice a particular skill is less than what they would have desired. However, the overall quality of the four levels is excellent, particularly in the scope and sequence of the content and the help available to the student who makes an error. Weaknesses include the provision of one attempt only, the slow generation of some graphics and the incomplete metrication. The most serious limiting factor for classroom use however is the price which may prove to be prohibitive. The packages are expensive but their value should be measured against the number of objectives covered and the number of diskettes in the package.

STATUS

"Mathematics Levels A, B, C and D" have been designated as **RECOMMENDED** learning resources for grades 1 - 9. See the specific grade designations noted earlier in the report.

PURCHASE INFORMATION

Alberta schools may purchase the products from the School Book Branch at the following approximate prices (1984): Level A - $230; Level B - $400; Level C - $500; Level D - $500. Diskettes may be purchased individually for approximately $60 (1986).

Defective diskettes will be replaced without charge within a 90 day warranty period. Diskettes which become inoperable through normal use may be replaced for approximately $25. There is no time limit for this warranty.

As diskette access is frequent, use of a diskette is limited to one computer at a time.

MATH SEQUENCES (REVISED)

DESCRIPTION

Title: Math Sequences
Authors: Educational Software Systems
Publisher: Milliken Publishing Company
Source: 1100 Research Blvd. St. Louis, Missouri 63132
Subject: Mathematics
Topics: Whole numbers, fractions, decimals, integers, percents, number readiness, equations & measurement formulae
Components: 16 diskettes, teacher guide (72p.), four duplication masters
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monochrome monitor
Other Formats Available (not evaluated): Commodore Pet, Atari 800, TRS 80 Level II
Alberta Education Call No.: QA 139 M654m 1980

Version: 1985
Display Language: English
Cost: $742.50 (1986)
Tel. #: (314) 991-4220
Users : Grades 1 - 8

OBJECTIVES

To provide drill and practice in arithmetic skills introduced in grades 1-8.

PEDAGOGICAL CONTENT DESCRIPTION

The package consists of 12 program diskettes, one on each of the following: number readiness, whole number addition, subtraction, multiplication and division, laws of arithmetic, integers, fractions, decimals, percents, equations and measurement formulae. Each skill area is divided into a number of small problem levels that gradually increase in difficulty. Students progress through these levels based on performance. A demonstration of mastery results in advancement while failure results in regression to easier levels. The teacher has control over these and other parameters through the management system.

PEDAGOGICAL CONTENT EVALUATION

On the whole, the range of the content is appropriate and effective. The sequencing of the content is excellently done with small increments and a very orderly progression from one level to the next. It should be noted that these are drill exercises and no instruction in the skill/concept is provided. Minor problems are the incorrect use of metric symbols and some improper decimal notation (e.g. .25 instead of 0.25).

INSTRUCTIONAL FORMAT DESCRIPTION

Most of the user's interaction is through entry of numerical answers which are evaluated upon entry. In addition, the user may request help with renaming, may change quotient answers and may end the drill.

Feedback is provided in either textual or graphical mode as specified by the student. There is a variety of positive feedback messages, each of which lasts approximately three seconds before erasure is possible. Negative feedback occurs after the second error in a problem and consists of a flashing text statement followed by a demonstration of the solution. Quantitative feedback is provided through a series of letters and numbers at the bottom of each page and through narrative statements at the end of the drill.

Evaluation is done through embedded tests. The number of questions to be done and the mastery and failure levels can be specified by the teacher through the management system. A question is considered wrong on the second attempt. If only one error is made, the question is recorded as correct. The product also includes pre-test and post-test diskettes which allow the teacher to determine the present level of performance of a student, determine how much learning has occured and automatically make assignments.

Students progress through the sequence of skills linearly. If they meet the criteria, the management system advances them to the next skill. They will automatically be dropped to an easier level if failure is met.

INSTRUCTIONAL FORMAT EVALUATION

There are a number of instructional format weaknesses:

1. Negative feedback shows how the correct answer is obtained but does not involve the user in that lesson.
2. Positive reinforcement screens might be considered to be boring and time consuming. These however are optional.
3. Younger students may find the quantitative feedback coding to be confusing.
4. It may be considered inappropriate to allow a student who makes a mistake on his first attempt at each question to end up with the same score as a student who makes no errors.
5. If a student hits the wrong key by accident, (s)he has no chance to correct the input.

Notwithstanding the above criticisms, the overall instructional format is satisfactory. While there is room for improvement, the package can be used effectively within a classroom setting.

TECHNICAL CHARACTERISTICS DESCRIPTION

High resolution graphics are used in large size numbers, mathematical symbols and positive reinforcement.

TECHNICAL CHARACTERISTICS EVALUATION

In the "Number Readiness" diskette, the graphics are slow in appearing and may be confusing because of the way they are printed on the screen. In the "Equations" diskette, the fact that the equations are printed opposite to the way that they are read may be confusing and delaying.

The positive reinforcement graphics may be inappropriate and time consuming, particularly for older students. However, the student may elect to receive text statements. Generally, graphics and display designs are appropriate and effective. The technical quality may be considered to be very good.

Users of the old version have noted that program diskettes had a tendancy to fail prematurely. The new version has two features which add considerable reliability. Firstly, the program will advise the user if his/her drive speed is too high and will not load the program any further. Secondly, the management system allows the teacher to store student data on backup diskettes. These should alleviate most problems associated with disk failure.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

Initialization, student management & class management functions are available in a management system. These include: making individual or class assignments, specifying mastery/failure levels and the number of questions and reviewing class/student progress. Also, there are functions to add, list, delete students, etc. The management system resides on each diskette and has a capacity of five classes per diskette to a maximum of 100 students.

The revised version of the product contains a number of enhancements. In addition to pre-test and post-test diskettes described earlier, the teacher may access a worksheet generator which will generate printed worksheets containing 10-30 questions for any problem level in either standard or enlarged print. An answer sheet is also generated separately. In addition, all student names and passwords in a class may be moved from one program diskette to another, thus eliminating the need to enter the class list twelve times. Another enhancement is the ability for backups to be made of student data - records from up to four program diskettes can be stored on a locally provided data diskette. Records can also be transferred back to the program diskette.

The teacher's guide contains scope and sequence charts, operating procedures, management system description, instructions on use, problem level examples and xerox masters.

IMPLEMENTATIONAL SUPPORT EVALUATION

The management system allows a teacher to specify a wide variety of student assignments and to receive a good deal of information about the student(s). The teacher using this system should be prepared to read the manual carefully and attempt some trial entries before full use. There is some confusion in making inputs, viewing the graphic results and making lists. List making is slow.

The enhancements added to the revised version make the program much easier to use in a classroom situation. The availability of pre-tests and post-tests, the worksheet generator, the ability to transfer class lists and the availability of backups to the data are significant improvements.

SUMMATION

For the amount of content covered and the price, the Milliken Math Sequences should be highly considered. There are some weaknesses (e.g. the lack of corrective feedback) but the advantages of the content development and the support for the teacher in the management system far outweigh what disadvantages may be present. Teachers who are prepared to spend the time to learn the management system and to become familiar with the content sequence will find that the package will be effective.

The revised version contains little changes in the content but it has significant improvements which will make the program much easier to use and more reliable in the classroom. Unfortunately, the price has also been increased significantly. Nevertheless, "Math Sequences" is a product that all elementary and junior high schools should have in their collection.

STATUS

"Math Sequences" has been designated as a **RECOMMENDED** learning resource for grades 1 - 8

PURCHASE INFORMATION

Alberta schools may purchase this product from the School Book Branch for less than the $742.50 selling price. A set of backup diskettes may be purchased for approximately 50% more; also, individual diskettes may be purchased. Please refer to the SBB catalog for actual prices. Defective diskettes will be replaced without charge within a 30 day warranty period. Diskettes which become inoperable through normal use may be replaced, within 13 months, for approximately $14 each.

As diskette access is frequent, diskettes in this package may be used with only one computer at a time.

MATH STRATEGIES: PROBLEM SOLVING

DESCRIPTION

Title: Math Strategies: Problem Solving
Version: 1983
Publisher: Science Research Associates (Canada) Ltd.
Cost: $210.00 (1985)
Source: 707 Gordon Baker Road, Willowdale, Ontario, M2H 2S6
Tel. #: (416) 497-7707
Subject: Mathematics
Users : Grade 6 - 12
Topics: Simplifying problems; problem breakdown; choosing information; using models; challenges
Components: 2 disks, teacher guide (28p.), 20 student texts (108p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monochrome monitor
Other Formats Available (not evaluated): TRS 80 Model III

OBJECTIVES

This program is designed to provide instruction and practice in solving multiple-step problems using four problem solving strategies: simplifying a problem, breaking a problem into parts, identifying needed additional information, and making a model of the problem.

PEDAGOGICAL CONTENT DESCRIPTION

This program, on two disks, consists of sixteen problem settings designed to help students use the four problem solving strategies. Each problem setting consists of many problems. The students are given an introductory problem which they try to solve at the computer with "help" being provided when needed or upon request. The student is then encouraged to solve derivative problems, based on the introductory problem, until they no longer require help. The program consists of the following six chapters:

1. USING THE CALCULATOR: Each computer problem has a built-in calculator. The numbers and symbols that are entered remain displayed on the screen and the student can view a complete sentence when the calculation is completed. The calculator is used to perform a variety of operations with whole numbers, decimals, percents and fractions.
2. SIMPLIFYING PROBLEMS: Students are to solve problems by substituting easier data for the given data. This involves estimating before making actual calculations. These problems begin with one-step problems and then move to multiple-step problems.
3. PROBLEM BREAKDOWN: This chapter provides practice in solving multiple-step problems by breaking them down into smaller parts and solving each part.
4. CHOOSING INFORMATION: Students choose information needed to solve multiple-step problems from a list containing extraneous information.
5. MODELS: Students use pictures and charts to solve multiple-step problems.
6. CHALLENGE PROBLEMS: Students will solve more difficult multiple-step problems using the strategies of chapters 2-5. This includes evaluating expressions containing more than one operation, with or without parentheses, writing math sentences for the problems, using the calculator to find powers of numbers and changing numbers written in scientific notation or e-notation into standard form. Most of this chapter is for more advanced students.

PEDAGOGICAL CONTENT EVALUATION

The content range and sequence are appropriate for most of the target audience; however, some of the content may be too difficult for grade six students and much is too easy for senior high students. The sequencing is from easy to difficult with appropriate sized increments. The user can enter into the sequence at intermediate steps. The depth of the program is appropriate and effective in achieving the intents of the program. The student has ample opportunity for practicing the skills. Definitions and explanations (HELP) are available whenever required. This assistance is effective and adds considerably to the strength of the program.

The content is presented in a clear and concise manner. It is noted that not all of the content is metricated and there are some problems which focus on the United States; however, this does not preclude the use of this program in Alberta schools.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of menu selection, page turning, multiple choice entry, and input of calculations and answers. The student has the option of using the calculator function as required or doing the calculation on paper and then inputting the answer. If the student requests HELP, then the program presents a problem in a step-by-step manner and the student responds accordingly.

The questions in the first chapter are preprogrammed. In all subsequent problems the introductory problem remains consistent, but the derivative questions appear to be randomly generated.

Immediate feedback is usually provided after each user input. A correct response results in a brief congratulatory message. In most cases an incorrect response results in an audio beep to signify the utilization of a wrong key or the student is told to try again. The student has the option of asking for HELP or may continue to try to solve the question on his/her own. After the second incorrect response, the program usually suggests doing it together and explanations and assistance are given. No quantitative feedback is provided.

A reproducible pre-test is included in the teacher documentation. No post-tests are provided.

Branching is provided in the program to give a "little help" or "lots of help". In some problems, the student is also able to go back to a previous step by typing "R". The branches review facts or provide information in alternate ways such as a different diagram, a restatement of facts in point form, etc. for the applicable step in the problem solution.

INSTRUCTIONAL FORMAT EVALUATION

The instructional techniques used in this program are appropriate for most of the target audience. Student interaction is appropriate with the student being an active participant throughout most of the program. There appears to be sufficient interaction to promote learning. The calculator function is a definite advantage in this program; however, no check is made on the validity of an entry when a student estimates an answer. Any numeric entry is accepted, even if it is inappropriate for the calculation; however, the student can later compare the estimate with the calculator answer. If a student persists at trying hard problems without requesting help, (s)he can continue indefinitely. The use of "R" to back through the steps when a correction is needed is a good feature.

The questioning techniques are appropriate and generally effective. The derivative problems are randomized from a limited data base, but in some problems such as in Museum Trip the data bank is seriously limited by the values used. The cueing techniques are effective. The feedback which is positive, immediate and corrective is appropriate and effective for the target audience.

The pre-test which is provided will be helpful in initially checking out a student's problem solving skills.

The branches are appropriate and helpful and add strength to the program.

TECHNICAL CHARACTERISTICS DESCRIPTION

Text and numbers are standard size and upper and lower case letters are used. Large print and inverse are used for emphasis e.g. names of the sections, positive feedback, etc. Some graphics are used in charts and diagrams within the program as well as in the little " happy face" which is used as a reminder to press the return key. The graphics are in color. An audio beep is used when a student hits an incorrect key.

TECHNICAL CHARACTERISTICS EVALUATION

The displays are appropriate with upper and lower case letters utilized effectively. They are well organized and are easy to read and follow. Occasionally the screen appears to be crowded. The transition from one screen to another is good. Selective erasing is effective. The graphics are used appropriately and are effective on a monochrome screen as well as on a color monitor. The program is user friendly and it appears to be bomb proof under normal use. It can be used readily by a teacher with mimimum computer competence.

IMPLEMENTATION SUPPORT DESCRIPTION

The entry competencies required for this program are a basic understanding of whole number operations, decimal and percent notation, rounding and estimation. An orientation session with the students prior to using the program is recommended.

A management system is not included in this program.

The teacher documentation includes the rationale for the program, instructional objectives, suggested grade levels, strategies for implementation and integration, suggested pre- and post-activities and sample program runs.

A student text is available which includes pre-instructional activities, work sheets and follow-up activities. The user materials are an integral part of the total program.

IMPLEMENTATION SUPPORT EVALUATION

Most of the entry competencies which have been identified are appropriate for the target audience. Perhaps, the knowledge of exponents and e-notation could be added to that list. The teacher documentation is well organized and easy to follow. The user support materials are effective and contribute to the learning process.

This program consists mainly of problem solving; however, the problems vary in kind and level and are adaptable to a variety of classroom learning environments. This computer program is easy to use and can be used by a teacher with a minimum of computer competency. Since error handling and identification procedures are not recorded, the teacher will need to supervise this aspect. It is also noted that multiple copies of the disks may be required since the disk is constantly accessed and thus can only be used individually or with a small group.

SUMMATION

The content range, sequence and depth are appropriate and relevant to the target audience. The inclusion of challenging problems is very good; however, it is unfortunate that all portions of the program are not metricated and that some problems contain American content. The inclusion of the calculator functions is a very good feature.

The major weakness of the program is the lack of a management system. Also, although the instructional techniques are good, the questions in some chapters could be randomized more effectively with a larger data base. Also, the price is somewhat high even considering the inclusion of a set of workbooks.

STATUS

"Math Strategies: Problem Solving" has been authorized as a **SUPPLEMENTARY** resource for grades 6 - 12.

PURCHASE INFORMATION

This product may be purchased for $210.00 (1985) from Science Research Associates at the address given at the beginning of the report. Note that that price includes 20 student texts. Additional texts may be purchased for $69.00 per pack of 10.

Defective diskettes will be replaced without charge within a 90 day warranty period. Subsequently diskettes which become inoperable through normal use may be replaced for $20. There is no time limit for this warranty.

Due to frequent disk interaction, this disk may be used with only one computer at a time.

MATH-THÉMATIQUE 3
MATH-THÉMATIQUE 4
MATH-THÉMATIQUE 5
MATH-THÉMATIQUE 6

DESCRIPTION

Titre: Math-Thématique 3, 4, 5, 6
Auteur(s): Doug Super et al
Éditeur: Houghton Mifflin Canada Ltd.
Source: 150 Steelcase Road West, Markham, Ontario L3R 1B2
Matière: Mathématiques

Version: 1983 - 1986
Langue d'affichage: Français
Coût: 225 $ à 250 $ (1984)
Tél.: (416) 475-1755
Utilisateurs: 3e, 4e, 5e, 6e année

Sujets: MAT 3: nombres entiers et décimales; estimations; résolution de problèmes; l'heure; la congruence
MAT 4: nombres entiers, décimales et fractions: estimations; résolution de problèmes; aires; la congruence; faire du change
MAT 5: nombres entiers, décimales et fractions; estimations; résolution de problèmes; arrondissements; aires et périmètres; l'heure
MAT 6: nombres entiers, décimales et fractions; estimations; résolution de problèmes; système métrique; l'heure

Composantes: 3 disquettes et 3 disquettes de rechange, guide du maître, fiches de travail et activités suggérées
Matériel requis: Apple II+/IIe/IIc, 48K, 1 unité de disque, moniteur couleur (préférablement)
Disponibilité sur d'autre ordinateurs (pas d'évaluation): Disponible en français sur Apple seulement. Une version anglaise du programme est aussi disponible sur Apple.

OBJECTIFS

Ces ensembles sont conçus pour engager les élèves dans des expériences pratiques comprenant l'estimation, les stratégies et résolution de problèmes, le développement des concepts et renforcer les habiletées de base en mathématiques.

DESCRIPTION DU CONTENU PÉDAGOGIQUE

Chaque ensemble dans cette série, MATH-THÉMATIQUE, comprend 15 programmes présentés sous forme de jeux. Chacune des activités vise directement à appuyer le concept central d'une des unités du livre correspondant de "Houghton Mifflin Mathématique". Ce didacticiel sert de matériel complémentaire au manuel de l'élève de Houghton Mifflin et ne doit pas être utilisé seul. Le matériel d'appui qui accompagne chaque jeu consiste en des fiches de travail et des activités.

L'organisation des jeux permet à l'élève ou au groupe d'élèves de jouer contre l'ordinateur ou entre eux. Plusieur activités sont ouvertes, ce qui permet un travail à des niveaux variés de complexité. De plus, la résolution de problèmes par l'interaction des élèves en groupes est encouragée.

ÉVALUATION DU CONTENU PÉDAGOGIQUE

Le contenu, l'ordre de présentation et le niveau de difficulté sont adaptés au programme d'études de l'Alberta. Chaque ensemble contient des programmes qui sont trop difficiles pour la plupart des élèves du niveau correspondant (soit à cause du traitement du contenu ou des stratégies pour résoudre des problèmes), mais qui seraient plus appropriés pour de l'enrichissement. Comme tel, le contenu de n'importe quel ensemble pourrait peut-être être utilisé dans un autre niveau.

Le contenu est à date et sous forme métrique. Les programmes renforcent les stratégies de résolution de problèmes, les estimations et le développement d'habiletés de base de façon à intéresser et motiver l'élève.

Bien que l'on puisse utiliser les programmes avec n'importe quel livre déjà autorisé, à condition de présenter aux élèves les activités de préparation, ils sont élaborés spécialement pour compléter les manuels de Houghton Mifflin. Lorsqu'ils sont utilisés avec l'enseignement en classe et conjointement avec les fiches de travail et les activités suggérées, ces ensembles rencontrent bien les objectifs prescrits.

DESCRIPTION DES TYPES D'INTERVENTION PÉDAGOGIQUE

L'interaction avec l'ordinateur consiste à faire des entrées relatives à des réponses que l'ordinateur exige, à la sélection de menus et au choix du nombre de joueurs. Les clés qui ne conviennent pas sont figées. L'interaction parmi le groupe de joueurs peut être productive et y est encouragée.

Les questions sont posées au hasard. Les techniques de rétroaction varient d'un programme à l'autre mais sont presque toutes présentées sous forme graphique avec l'aide de sons appropriés. Un indice donnant à l'élève une idée de la proximité de sa réponse à la bonne réponse, une comparaison de l'exactitude d'une estimation, l'élimination ou l'addition d'obstacles, l'acquisition de points, la terminaison d'un tour, etc. sont des exemples de rétroaction.

La rétroaction positive sous forme de graphiques motive l'élève à chercher la bonne réponse.

ÉVALUATION DES TYPES D'INTERVENTION PÉDAGOGIQUE

L'interaction est logique et les techniques d'enseignement utilisées dans ces programmes sont appropriées aux classes types de 3e, 4e, 5e et 6e année. La structure des jeux est à la fois unique et pleine d'imagination et renforce les principes qui sont enseignés dans la classe. Quelques-uns des jeux seulement sont minutés et le fait d'être associés à un tableau qui est visible et qui change continuellement augmente la motivation et l'intéret de l'élève ainsi que le désir de s'améliorer. Les élèves peuvent se mesurer à l'ordinateur ou à d'autres élèves et sont encouragés à regarder attentivement les réponses de leurs adversaires de façon à prévoir une stratégie efficace à leur tour.

La rétroaction instantanée et l'absence de pression pour l'apprenant sont très appropriées. Les graphiques, le texte et le son sont tous utilisés avantageusement. Par contre, on doit noter qu'aucune aide ou explication n'est donnée quand la réponse n'est pas bonne. Les élèves qui ont des difficultés avec les concepts ou les stratégies à utiliser peuvent ressentir de la frustration devant certains jeux. Comme il n'y a aucune explication du jeu sur la diskette, les débutants peuvent se sentir frustrés. Un enseignement préalable au travail sur diskette devrait être donné aux élèves.

DESCRIPTION DES CARACTÉRISTIQUES TECHNIQUES

Les graphiques sont une composante essentielle aux programmes. Les couleurs sont aussi utilisées mais un moniteur couleur n'est pas obligatoire. Le son est optionnel et peut être contrôlé par l'enseignant/e.

ÉVALUATION DES CARACTÉRISTIQUES TECHNIQUES

La création technique des programmes est excellente. Les affichages à l'écran sont très appropriés et efficaces; le texte est clair et facile à lire et la transition d'un affichage à l'autre se fait très bien. Chaque programme est doté d'un son optionnel. L'utilisation de textes (caractères) de grandeur normale pour des commentaires généraux et de grand format pour des nombres ou des concepts importants, est très efficace. Le programme est bien gardé puisque toutes les clés qui ne sont pas nécessaires au jeu ne fonctionnent pas.

DESCRIPTION DU MATÉRIEL D'APPUI

Le programme est accompagné d'un système de gestion pour l'enseignant/e qui lui permet d'utiliser le son et de contrôler la sélection des programmes à utiliser par les élèves. Le guide du maître contient des fiches de travail, des instructions pour l'utilisation des programmes, des suggestions d'activités pour la classe et décrit les objectifs de chaque programme.

ÉVALUATION DU MATÉRIEL D'APPUI

Le système de gestion est facile d'accès et d'utilisation. La documentation est bien organisée et il est facile de suivre les directives. Les fiches de travail sont étroitement reliées aux programmes de l'ordinateur et nous permettent de suivre facilement le progrès de l'élève.

SOMMAIRE

Les points forts de ces ensembles résident dans sa corrélation étroite avec le programme d'études de l'Alberta, la grande pratique offerte par les activités d'estimation et de résolution de problèmes et l'usage efficace de graphiques et de sons pour intéresser et motiver les élèves. Les ensembles sont excellents.

Les enseignants devront aider les élèves ayant des difficultés puisque la rétroaction est limitée et certaines des activités pour résoudre les problèmes peuvent s'avérer trop difficiles pour les élèves plus faibles.

STATUT

Les ensembles: "MATH-THÉMATIQUE 3", "MATH-THÉMATIQUE 4, "MATH-THÉMATIQUE 5" et "MATH-THÉMATIQUE 6" sont reconnus comme ressources pédagogiques de statut **"recommandé"**.

ACHAT

Les écoles de l'Alberta peuvent acheter ces ensembles du "School Book Branch" pour un prix spécial aux environs de 150 $ (1985) chacun. Les diskettes fautives sous garantie seront remplacées, sans frais, dans les 30 jours suivant l'achat. Il est à noter que ces ensembles contiennent des disquettes de rechange. Les disquettes qui ne peuvent plus être utilisées à cause d'un usage normal, peuvent être renvoyées au S.B.B. et remplacées au coût de 28 $ (approximativement). Il n'y a pas de temps limite sur cette offre. Ces disquettes ont l'avantage de pouvoir être utilisées sur plus d'une machine à la fois, s'il n'y a qu'une seule activité qui est mise en action en même temps; par contre, cet usage est soumis aux lois qui régissent les droits d'auteur et toute licence ou entente acceptée lors de l'achat du matériel.

MATH VOYAGER

DESCRIPTION

Title: Math Voyager
Author(s): Larry Schroeder
Publisher: Computer Learning Services
Source: 1705 Cardinal Drive, Galesburg, IL 61401
Subjects: Mathematics
Topics: Addition, subtraction, multiplication, division, place value
Components: 2 data disks, 1 startup disk and backup, teacher's guide (25p.), scope & sequence chart
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monitor
Other Formats Available (not evaluated): TRS-80 Model III/IV
Alberta Education Call No.: QA 139 M426 1983

Version: 1983
Display Language: English
Cost: $49.95 US (1986)
Tel. #: (309) 342-8715
Users: Grades 2 - 6

OBJECTIVES

This program is designed to enable students to perform basic arithmetical computations correctly and with understanding so that they can feel confident about their math skills and thus good about themselves.

PEDAGOGICAL CONTENT DESCRIPTION

Magic Voyager consists of eight programs which provide a discovery stage which emphasizes understanding of the basic facts in addition, subtraction, multiplication and division followed by drill and practice.

The content of each program is as follows:

1. Video Rods: The user has a choice of Training Voyage or Discovery Voyage. In both choices cuisenaire rods and digital representations pose the math question; however, the answer is shown in the Training Voyage and the user only needs to copy it, while in the Discovery Voyage the answer is not given unless the time runs out. If the student asks for help, a hint is given.
2. Video Blocks: Practice is provided in simple multiplication and division with factors up to nine using displays of rods. The user can choose a time factor from 10 to 30 seconds before the answer is shown. Problems which are incorrect appear again.
3. Timed Flash Cards: Math facts involving factors of nine or less in all four operations are presented for drill and practice. Instant recall is encouraged.
4. Multi Rods - Addition: The user can discover and understand the concept of addition using ones and tens along with regrouping (carrying) process using cuisenaire rods.
5. Beyond 18 - Addition: A step-by-step procedure is required for performing increasingly complex addition problems, with or without regrouping, involving up to nine digits.
6. Multi Rods - Subtraction: Using ones and tens with the regrouping (borrowing) process using rods is presented.
7. Beyond 18 - Subtraction: Increasingly complex subtraction problems, including those with zero in the minuend and as many as seven digits, are presented for step-by-step solutions.
8. Beyond 81 - Multiplication: Practice is provided in more complex multiplication problems which include zeros in the multiplier and may have as many as five digits with or without regrouping.

PEDAGOGICAL CONTENT EVALUATION

The range, depth and sequence of content are all appropriate and effective for the target audience. There is no set number of questions and a student can do as may problems as (s)he or the teacher desires. The sequencing is good and the problems which were incorrect are generally presented again. In a few instances the graphic displays were somewhat confusing to the students; however, generally the use of video rods and blocks is very helpful and appropriate to the medium.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of menu selection, name entry, a choice of the number of factors to work with, choice of time, use of the space bar in some cases to move the program along and inputting of numerical responses to the problems. The user may check his/her scores, ask for help, change programs and exit the program at any time.

Questions are randomly selected from a large data bank. Correct responses are generally acknowledged with a complimentary message; however, sometimes the program just moves to the next question without comment. The feedback varies when an incorrect response is given. In some programs the correct answer is provided immediately while in other programs the student is told to try again and the correct answer is given after two tries. In some programs graphic feedback is presented to show a comparison between the student's response and the original diagram in the question. Quantitative feedback is provided and the student is able to check his/her scores at any time. The log indicates the number correct, the number wrong and the percentage. Cumulative results can be printed.

No pre- or post-tests are included in this program. Remedial branches are not available. There is a "help" function which usually flashes the answer briefly or gives a hint such as telling the student to use one or two digit answers. The sequence, rate and amount are user controlled.

INSTRUCTIONAL FORMAT EVALUATION

Student interaction is appropriate for the target audience and keeps the user's attention while promoting learning. It is noted that younger students will likely find the selection of time, the highest and lowest factors and type of program confusing. Perhaps it would be more appropriate for the teacher to set these parameters.

The questions which are randomly accessed are effective for the drill and practice intended in this program. The program does not allow incorrect answers at any step in the process; errors must be corrected before a student proceeds.

Positive feedback is immediate and appropriate in some programs; however, sometimes no feedback is provided and the user is left wondering if the answer is correct until the next problem appears. The negative feedback and the opportunity to redo incorrect problems is good. The graphic displays of student responses as compared with the desired response is very good; however, it would be advantageous to have the student press a key before the display disappears rather than having it disappear before the student has ample time to study it. Some younger students found the method used to demonstrate regrouping to be somewhat confusing.

TECHNICAL CHARACTERISTICS DESCRIPTION

The text size is larger than normal. Color and some graphics are used in parts of the program. No sound is used.

TECHNICAL CHARACTERISTICS EVALUATION

The text is usually large and easy to read. The graphics used for the cuisenaire rods are colorful and represent the size of the answers entered by the students. The graphics used for the blocks in multiplication and division problems are also appropriate in size. Some of the displays for regrouping appeared to be cluttered and somewhat difficult for some students to understand.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

No prerequisite skills beyond the normal grade level skills are required.

The management system has a capacity of thirty students. The information on each student includes the program number, student's name, the percentage score, the number right, the number wrong, the time before the correct answer is shown, the level used and the type of problems.

The documentation provides an introduction to the program, information on using the program, detailed instructions for using each program, information on planning the application of the program, a step-by-step presentation through the Video Blocks program, two program reference pages and a scope and sequence chart. No user support materials are included.

IMPLEMENTATIONAL SUPPORT EVALUATION

No special entry competencies are required beyond the fact that students should be able to read. This program is generally very easy to use but requiring a start-up disk before anything else can be done is a drawback. All the functions appear to work as described, sometimes with a slight delay or sometimes something has to be typed in more than once such as when the program is waiting for an answer and the user decides to exit. The documentation is good and relatively easy to follow. The skill program reference page and the scope and sequence chart are excellent and useful.

The management system is easy to use and is handy to check on a student's progress during as well as at the end of the program. It is most unfortunate that the log clears every time the computer is full or shut off but the information can be retained if a printer is available. The capacity of only thirty students may also be a disadvantage.

SUMMATION

This package provides drill and practice in basic mathematics functions with good content range, sequence and depth. User or teacher control of the program is good. The documentation, especially the skill program reference page and the scope and sequence chart, is excellent.

The positive feedback is weak in parts of the program. In presenting the programs using regrouping, the screen appears to be cluttered and causes confusion for some students.

STATUS

"Math Voyager" has been designated as a **SUPPLEMENTARY** learning resource for grades 2-6.

PURCHASE INFORMATION

This product may be purchased for $49.95 U.S. (1986) from Computer Learning Systems at the address given at the beginning of the report. A 64K version of the product which includes a management system capable of saving, summarizing and sorting information on 1000 students is also available for $69.95 U.S. (1986) but has not been evaluated. Updates from the 48K version to the 64K version will be available for $20 (U.S. 1985). The 48K version will continue to be available.

Defective diskettes will be replaced without charge within a 30 day warranty period provided that proof of purchase is provided with the defective diskette. Thereafter, disks may be replaced for $5.00 (U.S. 1985). Note that only the start-up diskette is protected and a backup is provided with the package. The data diskettes are unprotected and the user is authorized to make one backup copy of each.

The disks have the advantage of being capable of operation with more than one machine at a time once the start up system has been used and provided the drills do not require a change to another data diskette; however, such use is subject to copyright laws and any license or purchase agreement.

MEASUREMENTS

DESCRIPTION

Title: Measurements: Length, Mass and Volume
Author(s): Jim Blake
Publisher: Focus Media Inc
Source: c/o BLM, P.O. Box 2249, 175 Holiday Inn Drive, Cambridge, Ontario N3C 3N4
Subjects: Science
Topics: Measuring length, reading a triple-beam balance and a graduated cylinder
Components: 1 disk with backup, teacher's guide (14p.), worksheets (4)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monitor
Other Formats Available (not evaluated): Commodore 64

Version: 1984
Display Language: English
Cost: $88.50 (1986)
Tel. #: (519) 658-4621
Users: Grades 4 - 8

OBJECTIVES

The inferred objectives of this program are to reinforce and provide practice in the concept of linear, mass and volumetric measurements.

PEDAGOGICAL CONTENT DESCRIPTION

This program covers the skills of measuring length (students determine the length of a block placed alongside a metric ruler), mass (students read the weight of items placed on a triple beam balance) and volume (graduated cylinder displacement method). Each skill offers optional example problems. This is followed by a series of drill questions similar to the example problem(s). The user can elect to do as many problems as desired.

PEDAGOGICAL CONTENT EVALUATION

Content range is appropriate for the target audience, however students should have previous exposure to principles of measurement and decimal numbers. Although this program offers no sequencing, the random generation of unlimited drill questions is appropriate for the topic under consideration. The measurement simulations depicted in this program can be easily covered using real equipment; however, utilizing the computer provides efficient drill with unlimited practice and thus proves to be a good pre- or post-instructional mechanism.

The method of calculating length used in this program is unconventional as most people measure using a scale starting at zero. When a "middle portion" of a scale is used for measurement it requires subtraction which allows room for arithmetic error in addition to a reading error. While metric measurements are used, students are not required to use SI Metric conventions.

Teachers should note that the program on volume only provides practice in reading a triple beam balance and not in measuring using the balance. The readings are preset by the program; it would be more beneficial if the student had to adjust the weights and then read the balance.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of menu selection, use of the RETURN to advance frames, and whole or decimal number entry. Shapes are generated from a fixed data bank, but since they are used with randomly selected numbers, each problem works with new data. A totally correct answer results in a musical melody and a congratulatory phrase; an answer within an acceptable margin of error responds with the precise answer and a message "You earned FULL credit"; an answer slightly further off target results in the message "You earned HALF credit". An incorrect answer prompts a textual response such as "You misread the scale" and provides a second attempt, after which the correct answer is given. A percentage score is given after each sequence of drill questions.

INSTRUCTIONAL FORMAT EVALUATION

This program can be effectively used either as a teacher demonstration tool or for individual student practice. The format of the questions requires very careful attention by the user as the scale graduations change frequently. Feedback in the volume calculation section is particularly effective as it is broken down into two sections.

It would be advantageous if the length measurement section followed a similar two step process to enable students to see whether mistakes were made in measurement or in subtraction. This could be given as part of an error routine. As all the programs stand, negative feedback consists solely of answer presentation. There is no assistance given in determining the reasons for the errors.

It would also be advantageous if the percentage evaluation would give an indication of the number of questions done or if the teacher had a means of insuring that students completed a set number of questions per section. As the quantitative feedback exists, it is based on the number of attempts made. Thus, a student who answers two questions correctly but fails a third completely, receives a score of 33%. In another type of question, a similar result could show as a quantitative score of 75%. One also wonders why quantitative feedback occurs only after correct answers. The quantitative feedback in the mass section has a programming error. If the student makes a keyboard entry error when asked if (s)he wishes another question, the quantitative feedback score is increased (e.g. by 10%, 25%, 33%.). Thus, it is not impossible for a student to obtain inflated figures, even those exceeding 100%.

The answer judging in the questions on length is extremely tough. These questions will be hard enough to do due to difficulty in reading the scale - they are made even tougher when answers that are within 0.3 of the correct answer are counted as wrong and given half credits only. As the student may have had to estimate both the top and the bottom measures, an error margin of 0.2 is rather hard to achieve, particularly for the younger portion of the target audience. These standards are at odds with the instructions to the student to "estimate".

TECHNICAL CHARACTERISTICS DESCRIPTION

High resolution colored graphics are used to depict the triple beam balance, the graduated cylinder and the ruler. Sound accompanies all feedback. Standard size text is used.

TECHNICAL CHARACTERISTICS EVALUATION

Character size is appropriate and graphics are generally clear, although occasionally the meniscus in the volume section obscures the scale. The inability to disable sound is a program weakness.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

The teacher's guide includes a program introduction, outlines objectives, summarizes program contents and provides suggestions for use for each of the sections. In addition it includes instructions for first time users, provides a guide for determining density, and gives a "Limits of Uncertainty" outline.

Student worksheets on the topics of "Measuring Lengths", "Measuring Masses", "Measuring Volumes" and "Determining the Density of a Rectangular Solid" are included.

IMPLEMENTATIONAL SUPPORT EVALUATION

The teacher's guide provides many useful implementation suggestions. The student worksheets, although simple, are useful additions. The program is very easy to use.

SUMMATION

This program offers the strengths of clear, colored graphical simulations, good question randomization, and complete loading upon initial booting. Its chief weaknesses are the inadequate and inaccurate quantitative feedback, the absence of corrective feedback, the inability to disable sound, the unreasonable error margin in program 1, the fact that SI metric is not employed, and the lack of a record keeping system.

STATUS

"Measurements: Length, Mass and Volume" has been authorized as a **SUPPLEMENTARY** learning resource for grades 4-8.

PURCHASE INFORMATION

This product may be purchased for $88.50 (1986) from Britannica Learning Materials at the address given at the beginning of the report. Defective diskettes will be replaced without charge within a 90 day warranty period. Thereafter, disks may be replaced for $19.50.

This diskette has the advantage of being capable of operation with more than machine at a time; however, such use is subject to copyright laws and any license or purchase agreement.

MEMORY: A FIRST STEP

DESCRIPTION

Title: Memory: A First Step in Problem Solving (Packages A, B and C)
Authors: Donna Stanger and staff of Rochester School District, Rochester, MN
Publisher: Sunburst Communications
Source: 39 Washington Avenue, Pleasantville, NY 10570
Subject: Problem Solving
Topics: Skills & strategies involved in problem solving
Components: 10 disks, teacher's guide (322p.), puppet
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, color monitor
IBM PC family, 64K, color graphics card, color monitor

Version: 1983
Display Language: English
Cost: $250.00 US (1985)
Tel. #: 914-769-5030
Users : Grades 1 - 6

Note: Three configurations of the product are available: Package A (K-2) contains diskettes 1-4 for $150 U.S.; Package B (K - 4) has diskettes 1-7 for $210 U.S.; and Package C (K-6) provides all 10 diskettes for $250 U.S. Each component is accompanied by the 279p. teacher's guide and a puppet.

OBJECTIVES

The package provides:

1. A framework within which the teaching of problem solving can be approached;
2. problem solving activities that can be taught in the classroom; and
3. computer activities to reinforce learning and make it fun.

PEDAGOGICAL CONTENT DESCRIPTION

This learning package contains 10 disks designed to improve memory and retrieval strategies. Ten specific memorization skills and strategies are presented: sequence, number of items to remember, auditory aids, regrouping, personalization, creating a context, self testing, whole to part, visual association, and mneumonic systems.

The object of each game is outlined below:

GRADES K - 2:

TEDDY AND IGGY - to observe and remember sequences of events or objects.

SIMON SAYS - to observe and repeat sequences of colors, numbers or letters.

CONCENTRATION - to observe and match objects, colors, words or numbers that are randomly hidden on a grid.

WHAT'S IN A FRAME - to observe up to nine objects in a picture frame and then be able to recall the ones that were present.

GRADES 3 - 4:

FIRST THINGS FIRST - to remember the sequence of a randomly depicted set of geometric shapes.

PICK THE PART - given two portions of a picture, to recall which one was not part of the original picture.

WAS IT THERE - given a complete picture followed by a partial picture, to identify the respective parts that formed the first and second pictures.

GRADES 5 - 6:

REGROUPING - to improve recall by reclassifying items according to self-related attributes.

MEMORY CASTLE - to use mnemonic memory aids to associate an external order with the memory task. (Students must remember a set of instructions in order to progress around a castle.)

SELF TEST - to provide practice recalling facts using the process of mental rehearsal. Students can test themselves on lists of words already in the computer or enter new word lists.

PEDAGOGICAL CONTENT EVALUATION

These programs provide a number of situations which invite the user to apply a variety of retrieval strategies in solving a problem. It should be noted that the program is dependent upon prior instruction by the teacher and effective use requires regular practice and comprehensive integration of the teaching of memory skills within the curriculum. For example, by themselves, the programs do nothing to ensure that the different processes of retrieval that are introduced are actually applied. Content strength would be improved if the user were guided through a particular memory development process, given explanations, examples, and illustrations, and then given practice questions in which the process could be applied in a step-by-step fashion with the computer providing monitoring and assistance. As these are not provided within the disks, the teacher must be involved throughout the learning process.

Since each program is contained on a separate disk, teachers can effectively choose the sequence of presentation. Content range is appropriate to the target audience; however, very young users may have difficulty reading the instructions and initial adult intervention may be necessary. A few of the programs contain American bias (e.g. reference to the Presidents of the United States, U.S. geography, etc.)

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of entry of alpha/numerical characters, and use of the space bar and return keys. The shapes, colors, pictures, letters, numbers, sounds, etc. that form each question are randomly chosen from a limited data bank. Feedback usually consists of short textual phrases displayed in a pre-programmed order. Corrective feedback is not employed in these disks. Quantitative feedback presents the number right out of the total numbers of questions posed. Sequence is initially selected by the user/teacher, however once into an activity, sequence is program controlled.

INSTRUCTIONAL FORMAT EVALUATION

Student interaction is appropriate for the target audience. The program responds well to unexpected entries, is very tolerant in accepting student responses and allows correction of incorrect responses.

Since a high degree of concentration is required in order to remember the sequences, student interest is maintained. Questions are effectively randomized and no repetition of sequences is apparent. The majority of the feedback is textual--more graphical feedback may be appropriate, especially for those programs geared for the lower end of the target audience.

Most of the programs contained in this package are computerized versions of activities/games that teachers likely already employ. While the use of a computer version does provide immediate feedback and thus frees the teacher from immediate supervision, the capabilities of the computer have not been fully utilized. For example branching is not employed, corrective feedback is not utilized and the programs provide no sequential step by step interaction which would ensure that specific or certain processes or strategies were being used. The activities are interesting but more creative and fuller use of the computer might have been employed.

TECHNICAL CHARACTERISTICS DESCRIPTION

The programs utilize color, graphics and sound. Both standard size and enlarged text are employed with most disks employing both upper and lower case letters.

TECHNICAL CHARACTERISTICS EVALUATION

Screens are well formatted and most displays are appropriate to the target audience. Division 1 students will require adult intervention (as suggested in the documentation) as character size and the amount of reading are not always appropriate. Graphics are generally effective provided that a color monitor is used.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

The 322 page teacher's guide includes preliminary lessons and classroom activities as well as suggestions for follow-up activities. The documentation provides the teacher with reading levels and age guidelines for the activities as well as advice where reading assistance may be required. Student support materials include worksheets, flash cards, activity sheets, etc.

IMPLEMENTATIONAL SUPPORT EVALUATION

Both the teacher and student support materials are very effective in supporting the goal of developing memory. Student activities are clearly organized with the skill area, grade, subject area correlation, pre-preparation activities, and lesson implementation plan included. High quality reproducible student worksheets are included which provide excellent disk support. Aside from the American bias which is evident in some of the activities, the implementational support is perhaps this package's greatest strength.

SUMMATION

This program provides a variety of unique, interesting activities designed to improve memory and recall.

While the interest levels and visual images are relevant to the target audiences, teachers will find that many of the activities could be accomplished by other methods than the computer. For example, many of the games/activities fail to use anything beyond the immediate feedback and graphic capabilities of the computer.

The major strength of this package is the provision of an overall strategy and strong teacher support materials. The use of the computer activities by themselves would not meet the objectives of the package nor are they intended to. As such, prospective purchasers of this product should be prepared to incorporate the development of memory skills into the entire curriculum and practice them regularly in a variety of situations. If that commitment to time is made, this package of print and computer materials will provide an excellent resource.

APPLE - IBM VERSIONS

This report was based on a review of the Apple version. The IBM version, although dated 1984 as opposed to Apple's 1983, reveals identical content. A difference was noted, however, in the number of players allowed on games--Apple allows up to six players, the IBM version allows up to four. Also, minor technical design changes were noted (e.g. color choices, character size, the addition of a quit option to the main menu) which enhance presentation on the IBM screen.

STATUS

The Apple and IBM versions of "Memory: A First Step in Problem Solving" have been authorized as **SUPPLEMENTARY** learning resources for problem solving in grades 1 - 6.

PURCHASE INFORMATION

This product may be purchased for $250.00 U.S. (1985) from Sunburst Communications at the address given at the beginning of the report. Note that Package A (disks 1-4) and Package B (disks 1-7) are available for $150.00 and $210.00 respectively. An extra teacher's guide may be purchased with an order of any package for $30.00 and backup diskettes are available for $15.00 each.

Sunburst Communications offers a lifetime warranty on their courseware products and will replace defective diskettes at no charge.

Each activity on a disk is usually completely loaded at the beginning of the game; however, due to the short length of time that each activity requires, the disks are generally restricted to use on one computer at a time.

MIC. ACTIVITIES FOR RECORDKEEPING

DESCRIPTION

Title: Microcomputer Activities for Recordkeeping
Authors: Richard Lasselle & Daryl Vanalstyne
Publisher: Houghton Mifflin Canada Ltd
Source: 150 Steelcase Road West, Markham, Ontario L3R 1B2
Subject: Business Education
Topics: Electronic recordkeeping, inputting, maintaining & outputting data
Components: 2 disks with backups, teacher's guide (68p.), student's guide (89p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monitor, 80-column printer
Other Formats Available (not evaluated): IBM PC/PCjr, TRS-80 Models III/IV

Version: 1984
Display Language: English
Cost: $109.85 (1985)
Tel. #: (416) 475-1755
Users: Grades 10 - 12

OBJECTIVES

This package is designed to :

1. Provide students with the opportunity to become computer literate.
2. Enable students to use a microcomputer in tasks relating to eight typical recordkeeping jobs.
3. Familiarize students with the procedures used to process records with a computer.
4. Help students realize the importance of accurate data entry.
5. Help students understand the limitations and capabilities of the computer.

PEDAGOGICAL CONTENT DESCRIPTION

This program is a series of record-keeping simulations designed to give students an opportunity to use a microcomputer as if it were a terminal in an office. The disk contains nine activities: the first program is an orientation to computers; the remaining eight programs contain a sampling of the recordkeeping activities involed in eight office positions--sales clerk, stock clerk, purchasing clerk, accounts payable clerk, order clerk, accounts receivable clerk, cash clerk and payroll clerk. Each job simulation can be completed as an independent activity in a 40 to 60 minute session. The printed reports generated as a result of the computer input provide a record of the time taken by the student to complete the activity.

PEDAGOGICAL CONTENT EVALUATION

This program does not teach recordkeeping principles, but it does provide an opportunity for students to apply principles and to become familiar with the procedures used to process records in a variety of recordkeeping positions. The importance of speed and accuracy and of saving data become apparent to the student as (s)he works through the activities.

The range and sequence of the activities are appropriate to the target audience. Adequate depth is available insofar as ample instructions and examples are available, however a few of the simulations could be improved by adding more detail and variation (e.g. Activity Two--Cash Register--is rather simplistic).

An American bias is evident in the choice of addresses and in the payroll clerk activities (i.e. deductions), however this is not a major detraction.

INSTRUCTIONAL FORMAT DESCRIPTION

The disk is designed to be used conjunctively with the user's manual. Each topic in the manual begins with an example, provides instructions for data entry, and offers several exercises designed to be completed conjunctively with the disk entry in order to reinforce the skills presented in the simulation. Each job simulation is followed up with a series of questions in the manual which test the student's understanding of the simulation.

While the program does not provide direct feedback regarding student input, it does provide frequent opportunities for students to verify the data they have entered. When data must be in a specified format or within a given range, error messages will denote invalid entries.

INSTRUCTIONAL FORMAT EVALUATION

Student interaction is varied and involves a lot of number typing in keeping with the demands of a recordkeeping job. While their is no built-in evaluation, the end-of-unit questions requiring written answers in the manual are an effective test of the students accuracy in entering data and interpreting the printed reports. (Suggestions for evaluating these answers are given in the teacher's manual.) Students have appropriate control over sequence, rate, and amount, yet the unobtrusive record of total time taken by the student to complete the activity provides an effective gauge of rate of performance.

TECHNICAL CHARACTERISTICS DESCRIPTION

Text is presented in upper case with 40 characters per line. Flashing and inverse highlighting are used for emphasis. Sound is occassionally used to denote invalid entries. Neither color nor graphics are used in this program.

TECHNICAL CHARACTERISTICS EVALUATION

Text, often in the form of documents, is well-designed and appropriate for the target audience. Being able to save data part-way through an activity is an advantage in a classroom setting, however it is unfortunate that the format is limits data entry to one student per disk.

Students must read and follow directions carefully, for it is possible to accidentally hit a key and cause the program to re-boot, thereby destroying all data. This could be used to advantage in a classroom, however, as it underscores the need for accuracy in entry.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

The 68 page teacher's manual contains suggestions for implementing and evaluating the simulation, it identifies courses in which the program might be incorporated, and it provides specific information about the features of the courseware (completion sequence, timing feature, error correction, exit options, etc.)

The 89 page user's manual contains an introduction which discusses the "setting" of the simulation, describes the "positions" the student will hold, and conveys information about computer operation. Each subsequent chapter of the manual provides an overview of the position under consideration and includes source documents, information, and exercises to guide a student through the job simulation.

IMPLEMENTATIONAL SUPPORT EVALUATION

Both the user's guide and teacher's manual are clearly written and well organized and both are integral to disk operation. Provided students are instructed to complete the orientation activity first, they should have no difficulty completing the simulation independently. Previous keyboarding experience is a definite asset when using this program.

SUMMATION

This program effectively simulates a "mainframe" computer system in which a variety of people in various positions input and extract data. Students, acting in these various positions, are able to follow the sequence of the recordkeeping activities of a business (e.g. see the relationship of the activities in the shipping and receiving department to those in the sales and purchasing departments, etc.) and see how data which is only entered once can be used by various departments other than the one which originated it. The program acutely emphasizes the need for accuracy as students realize that an error in one department can adversely affect the records of all other departments.

STATUS

"Microcomputer Activites for Recordkeeping" has been authorized as a **RECOMMENDED** learning resource for grades 10 - 12.

PURCHASE INFORMATION

Alberta schools may purchase this product from the School Book Branch for approximately $105. This includes the disks, backups, student workbook and teacher's manual. See the School Book Branch catalog for specific pricing and warranty information.

Due to frequent disk interaction, this product may be used on only one machine at a time.

MICROS MADE EASY

DESCRIPTION

Title: Micros Made Easy
Author: Ann Bishop
Publisher: Science Research Associates
Source: 707 Gordon Baker Rd., Willowdale, ON M2H 2S6
Subject: Computer Literacy
Topics: Keyboarding, computer parts and functions, programming
Components: 3 disks, user's guide (35p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, color monitor preferred;
IBM PC family, 64k, color monitor preferred
Other Formats Available (not evaluated): Available in Apple and IBM format only

Version: 1983
Display Language: English
Cost: $210.00 (1985)
Tel. #: (416) 497-7707
Users: Grades 4 - 9

OBJECTIVES

As a result of using this package, students will:

1. Be given an introduction to microcomputers, their components and their capabilities.
2. Have an elementary exposure to programming.

PEDAGOGICAL CONTENT DESCRIPTION

The three disks in this package contain six programs:

1. INTRODUCTION - covers the use and function of the RETURN and RESET keys, provides a brief explanation of input/process/output, discusses computer components, and provides an example of menu selections.
2. KEYBOARDING - introduces keyboard locations by having the user press highlighted keys. Shift key operation is explained and the differences between "1" and "L" and "zero" and "O" are discussed.
3. LEARNING ABOUT YOUR COMPUTER - discusses and provides examples of the capabilities of the computer (interaction, graphics, animation, calculation, memory, color, sound, etc.).
4. THE PARTS OF YOUR COMPUTER - explains the parts of the computer in relation to input, output and processing. A review and game are also included.
5. PECKING AWAY AT PROGRAMMING - contains six lessons which outline basic principles of programming such as accuracy, structure, sequence, conditions, etc. (The students use basic commands to control the movements of Omletta, the chicken.)
6. Basic BASIC - presents 13 lessons which cover the elements of programming in the BASIC language and includes such commands as Print, Let, Input, GoTo, If...Then, For...Next, and Read...Data.

Most of the programs contain information screens followed by interactive screens that allow the user to respond to questions pertaining to the lesson's concepts.

PEDAGOGICAL CONTENT EVALUATION

Content is well sequenced in small incremental steps and sufficient depth is present to meet the objectives of providing an introduction to computer literacy. Explanations are clear, straight-forward, and interesting. The weakest program in the series is "Keyboarding" as it presents key locations only with no instruction re. technique, finger usage, etc. Although the target audience is not specified by the publisher, content range appears to be most appropriate for upper elementary and lower junior high.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of menu selection, using the RETURN key to advance frames, and keying in words or phrases. Questions are presented in a pre-programmed order and immediate textual feedback is provided after each user response. Generally two incorrect responses are allowed before the correct answer is given. The programs do not offer evaluation or branching for review. The user initially selects the sequence and has control of rate at all times; within a lesson, both sequence and amount are program controlled.

INSTRUCTIONAL FORMAT EVALUATION

Student interaction is consistent and appropriate for the target audience. Feedback is generally good as incorrect answers are usually accompanied by an explanation. The types of control are effective, however it is impossible to advance quickly through a program to a desired point or to backpage for review.

TECHNICAL CHARACTERISTICS DESCRIPTION

High resolution generation is used for text and graphics. Color and sound are occasionally used both as part of the explanation and the feedback.

TECHNICAL CHARACTERISTICS EVALUATION

Screen displays are well formatted and appropriate for the target audience. Graphics are effectively used to show the inner workings of the computer. Since our preview copy of the program was written for the II+ keyboard, slight variations were encountered for the IIe and IIc which were not explained on the disk (e.g. the keyboard diagram varies slightly, the caps lock must be depressed on the IIe, etc.).

IMPLEMENTATIONAL SUPPORT DESCRIPTION

The thirty five page guide included with this package contains textual descriptions of the program contents, outlines learning goals for each program and provides basic computer operational instruction.

IMPLEMENTATIONAL SUPPORT EVALUATION

The user's guide is well organized and should be helpful in providing teachers with an overview of the contents of the disks as well as providing some background information to support the disk contents.

SUMMATION

The content of this package provides a basic introduction to computer literacy in a manner which is non-threatening to a novice. Sequence is logical, however the attempt to appeal to a broad target audience means that some sections will be too juvenile in presentation mode (e.g. Omletta, the chicken, is beneath the dignity of a junior high class) while others are beyond the lower target audience's range (e.g. "Basic BASIC" is geared to a grade 6+ audience). The cost of the package is also somewhat high considering that it can only be used by one student at a time.

APPLE - IBM VERSIONS

This report has been based on an evaluation of the Apple version. A review of the IBM version has revealed identical content, although it is spread over four disks as opposed to Apple's three disk package. The IBM version uses an 80 column screen display as opposed to Apple's 40 column display. User's should note that the program requires IBM 1.1 DOS for initial booting; 2.2 DOS or subsequent versions will not work.

STATUS

The Apple and IBM versions of "Micros Made Easy" have been authorized as **Supplementary** learning resources for computer literacy grades 4-9. Note the requirement of the IBM version for an old version of DOS.

PURCHASE INFORMATION

This product may be purchased for $210.00 (1985) from Science Research Associates at the address given at the beginning of the report. Defective diskettes will be replaced without charge within a 90 day warranty period. Subsequently, diskettes which become inoperable through normal use may be replaced for $20. There is no time limit for this warranty.

Because the program is highly disk interactive, it is limited to use by one student at a time.

MOPTOWN HOTEL

DESCRIPTION

Title: Moptown Hotel
Version: 1983
Authors: Leslie Grimm
Display Language: English
Publisher: The Learning Company
Cost: $85.95 (1985)
Source: c/o Addison Wesley, P.O. Box 580, 26 Prince Andrew Place, Don Mills, ON M3C 2T8
Tel. #: (416) 447-5101
Subject: Problem Solving
Users : Grades 2 - 4
Topics: Analogies, closed sequences, differences/uniqueness, negation, formulate and test hypotheses, planning
Components: 1 diskette and backup, teacher guide (49p.), activity sheets (black line masters)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, color monitor, joy stick optional
Other Formats Available (not evaluated): Available in Apple format only

NOTE:

"Moptown Hotel" is available in a home edition from The Learning Company as well as a school edition from Addison Wesley. The packages are identical in terms of disk content but vary in what is included with the package. The Learning Company version includes one disk and has a 31 page guide (small pages) which explains the games. The Addison Wesley version includes the disk as well as a back-up disk and contains 49 pages (regular size) of support, including black line masters. Descriptive and evaluative comments contained in the report are based on the Addison Wesley version.

OBJECTIVES

The learner will develop the logic skills of:

1. Recognizing analogies
2. Completing closed sequences
3. Identifying unique features
4. Understanding negation
5. Formulating and testing hypotheses
6. Planning.

PEDAGOGICAL CONTENT DESCRIPTION

This disk contains seven progressively ordered games designed to develop logic skills:

1. WHO'S NEXT DOOR: The student compares two figures on the screen and identifies the distinguishing trait. (S)he then creates the second member of another pair of figures so that they differ in a similar manner to the first pair.
2. CHANGE ME: Given the first and fourth figure in a sequence of four figures and given a rule about the differences between figures, the learner creates the middle two figures which complete the sequence.
3. SPOT ME: Given four figures, the learner identifies what unique feature makes one different from the rest.
4. WHOSE BIRTHDAY: Using program feedback concerning what traits a particular figure does not have, the student uses the skill of interpreting negative comments to guess the figure being described.
5. SECRET PAL: The student attempts to identify a particular figure by guessing its attributes. Using the feedback regarding how many attributes (s)he has chosen correctly, the student formulates a hypothesis and tests it.
6. MOPTOWN MAP: Five figures are displayed on a four by four grid. The student must identify the locations of the remaining eleven figures by determining the two rules that figures in each row and column must obey.
7. MOPTOWN HOTEL: Obeying rules about how many traits must differ between adjacent figures on the grid, players take turns putting figures onto a four by four grid.

Each game gives students the option of reading directions, and after completing a game (s)he has the option of playing the same game again or returning to the menu for an alternate selection. A set of five moppet playing cards which can be duplicated and used with students in a group situation are included.

PEDAGOGICAL CONTENT EVALUATION

The range, sequence, and depth of the programs are appropriate for the target audience and require the use of strategic thinking skills. Although the programs have clear playing instructions, there is no explanation of the strategy students should use, therefore the onus is upon the teacher to discuss the thinking skills involved and relate them to useful problem solving.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of selecting a game from the menu, electing to read/bypass instructions (these may be accessed at any time during the game by typing "?"), using the spacebar or return key to activate page turning, and entering single letters in response to choices given. Questions are randomly selected from a limited data bank. Feedback differs from game to game; correct answers are generally rewarded with a tune and a positive comment while incorrect answers receive a statement indicating that the input was wrong and a clue to aid in making a correct decision. A final evaluation is given in two of the programs: "Moptown Map" provides a percentage score based upon the number of turns taken and "Moptown Hotel" displays cumulative points and provides bonus points if the entire grid is completed.

INSTRUCTIONAL FORMAT EVALUATION

Active student involvement promotes motivation in each game. The feedback used is appropriate and complements the format of the game. Sequence, rate and amount are all appropriately user controlled.

While the playing instructions in the first five games are explicit, the instructions for "Moptown Map" and "Moptown Hotel" are somewhat ambiguous.

TECHNICAL CHARACTERISTICS DESCRIPTION

This program uses both high-res and low-res colored graphics. Sound, which is used for both positive and negative reinforcement, is optional. ESCAPE can be used to exit any program and to return to the main menu.

TECHNICAL CHARACTERISTICS EVALUATION

Graphic displays are well designed and are appropriate to the target audience and user-controlled sound adds interest to the feedback. Although shade differences are apparent when a monochrome monitor is used, a color monitor is certainly recommended.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

The original product, as distributed by The Learning Company, contains a user's manual of 31 pages and moppet cards.

The educational version, distributed by Addison Wesley, has an extensive teacher's guide. This includes general notes on teaching with computers, full descriptions of the programs and many suggested on-line and off-line activities in black-line master form. Note that the educational version also includes a back-up diskette.

IMPLEMENTATIONAL SUPPORT EVALUATION

The product as distributed by the Learning Company is intended to home use and, as such, minimal educational support is provided. The Addison Wesley package, while more expensive, includes extensive support. The suggested activities in particular are valuable additions to the package as they provide the teacher with implementational strategies for incorporating the programs into classroom activities. Black line masters for these on-line and off-line activities are valuable resources.

SUMMATION

The games contained on this disk are effective in developing problem solving skills and prove motivational to most students.

STATUS

"Moptown Hotel" has been authorized as a **RECOMMENDED** learning resource for grades 2 - 4.

PURCHASE INFORMATION

This product may be purchased in a number of configurations. The Learning Company (545 Middlefield Road, Suite 170, Menlo Park, California, 94025) provides a single disk package for $39.95 U.S. (1986). In addition, they provide a "lab pack" of five disks for $60 U.S. (1986). Defective diskettes will be replaced without charge within a 90 day warranty period. Disks which are damaged by the user will be replaced for $10.00 U.S. upon return of the damaged diskette. This includes diskettes which wear out through normal wear and tear. There is no time limit for this warranty.

The educational package may be purchased for $85.95 from Addison Wesley at the address given at the beginning of the report. Note that this package contains two copies of the disk as well as extensive documentation. A similar warranty package is also available.

As a recommended product, "Moptown Hotel" may be purchased by Alberta schools from the School Book Branch at a 15% discount. Please refer to their catalog for available configurations and prices.

This diskette has the advantage of being capable of operation with more than one machine at a time provided that only one activity is accessed; however, such use is subject to copyright laws and any license or purchase agreement.

MOPTOWN PARADE

DESCRIPTION

Title: Moptown Parade **Version:** 1983
Authors: Leslie Grimm **Display Language:** English
Publisher: The Learning Company **Cost:** $85.95 (1985)
Source: c/o Addison Wesley, P.O. Box 580, 26 Prince Andrew Place, Don Mills, ON M3C 2T8 **Tel. #:** (416) 447-5101
Subject: Problem solving **Users :** Grades 1-3
Topics: Matching similarities/differences, opposites and patterns/sequences; problem solving strategies.
Components: 1 diskette and backup, teacher guide (49p), activity sheets (black line masters)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, color monitor, joy stick optional
Other Formats Available (not evaluated): Available in Apple format only

NOTE:

"Moptown Parade" is sold in a home edition by The Learning Company as well as in a school edition by Addison Wesley. The packages have identical disk content but the package components are different. The Learning Company version has one disk and a 31 page guide (small pages) which explains the games. The Addison Wesley version has a disk and a back-up disk and contains 49 pages (regular size) of support, including black line masters. Descriptive and evaluative comments contained in this report are based on the Addison Wesley version.

OBJECTIVES

The learner will:

1. Identify similarities and differences in figures.
2. Recognize sequence patterns and apply them in next figure identification.
3. Identify the attribute(s) by which a cluster of figures is grouped.
4. Develop a language sequence of three adjectives followed by a noun.

PEDAGOGICAL CONTENT DESCRIPTION

Each of the seven games on this disk requires the student to identify a moppet--a figure made by combining the attributes of tall or short, fat or thin, red or blue, bibbit or gibbit (body features).

1. **MAKE MY TWIN: Given one moppet, the student constructs a matched pair** by choosing one correct attribute from each of four pairs of attributes.
2. **WHO'S DIFFERENT: Given four moppets, the student identifies** one which is different and indicates what attribute causes the difference.
3. **WHAT'S THE SAME: Given four moppets, the student identifies the attribute they share** in common.
4. **MAKE MY OPPOSITE: Given one moppet, the student constructs** an opposite to it.
5. **WHO COMES NEXT: Four moppets are arranged in one of three given patterns. The learner decides which pattern is being used and creates the next moppet.**
6. **MOPTOWN PARADE: The learner sees the first moppet in a parade of five. (S)he creates the next four moppets by choosing ones which differ from each other according to a set number of attributes.**
7. **CLUBHOUSE: The student guesses which moppets belong in a group** and uses the feedback to determine the rule(s) which determine the moppet grouping.

PEDAGOGICAL CONTENT EVALUATION

This disk uses eight character traits to describe the Moppet characters -- this results in appropriate range for the lower end of the target audience but may be limiting for older students. The fact that a student can stop playing a game after correctly answering one question suggests that there is insufficient depth. Although the student can elect to do as many questions as (s)he chooses, it would seem preferable to have a number of problems consecutively posed rather than having the user request a new problem each time. The program offers good sequencing from simple to complex provided the programs are completed in the order they are shown on the menu.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists menu selection, using/disabling sound, reading/bypassing instructions, page turning and entering single letters or numbers in response to choices given. Questions are randomly selected from a limited data bank. Feedback is given after each answer with textual feedback statements accompanied by sound effects. Flashing figures are used to reinforce correct answers. Incorrect answers generally result in the wrong part being identified or the correct part being specified. The student can elect to see the instructions at any time by typing "?" and can exit any program at will by hitting ESCAPE.

INSTRUCTIONAL FORMAT EVALUATION

Active student involvement promotes motivation in each game. Playing instructions are explicit, although very young students may need the terminology explained to them (e.g. "character trait"). The fact that students are asked to enter letters to build moppets and numbers to describe character traits proves confusing. It would be better if letters were consistently used.

The feedback complements the format of the game, however it does not explain why an answer is wrong. Sequence, rate and amount are all appropriately user controlled. Incorporating more evaluation may provide greater student motivation and aid the teacher in assessing student comprehension.

Since students are asked whether they wish to quit after each question, the option to exit a program using ESCAPE seems pointless.

TECHNICAL CHARACTERISTICS DESCRIPTION

This program uses both high-res and low-res colored graphics. Sound, which is used for both positive and negative reinforcement, is optional. Standard size text is used within each program, however the menu is displayed in enlarged print.

TECHNICAL CHARACTERISTICS EVALUATION

Graphic displays are well designed and are appropriate to the target audience. Program transition is smooth and sound, which can be user disabled, adds interest to the feedback. Although shade differences are apparent when a black and white monitor is used, a color monitor is certainly recommended.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

The original product, as distributed by The Learning Company, contains a user's manual of 30 pages and moppet cards.

The educational version, distributed by Addison Wesley, has an extensive teacher's guide. This includes general notes on teaching with computers, full descriptions of the programs and many suggested on-line and off-line activities in black-line master form. Note that the educational version also includes a back-up diskette.

IMPLEMENTATIONAL SUPPORT EVALUATION

The product as distributed by the Learning Company is intended to home use and, as such, minimal educational support is provided. The Addison Wesley package, while more expensive, includes extensive support. The suggested activities in particular are valuable additions to the package as they provide the teacher with implementational strategies for incorporating the programs into classroom activities. Black line masters for these on-line and off-line activities are valuable resources.

SUMMATION

This program effectively utilizes graphics, color and sound to provide an interesting introduction to problem solving skills which, although not directly a part of the primary curriculum, are necessary life skills.

STATUS

"Moptown Parade" has been authorized as a **RECOMMENDED** learning resource for grades 1 - 3.

PURCHASE INFORMATION

This product may be purchased in a number of configurations. The Learning Company (545 Middlefield Road, Suite 170, Menlo Park, California, 94025) provides a single disk package for $39.95 U.S. (1986). In addition, they provide a "lab pack" of five disks for $60 U.S. (1986). Defective diskettes will be replaced without charge within a 90 day warranty period. Disks which are damaged by the user will be replaced for $10.00 U.S. upon return of the damaged diskette. This includes diskettes which wear out through normal wear and tear. There is no time limit for this warranty.

The educational package may be purchased for $85.95 from Addison Wesley at the address given at the beginning of the report. Note that this package contains two copies of the disk as well as extensive documentation. A similar warranty package is also available.

As a recommended product, "Moptown Parade" may be purchased from the School Book Branch by Alberta schools at a 15% discount. Please refer to their catalog for available configurations and prices.

This diskette has the advantage of being capable of operation with more than one machine at a time provided that only one activity is accessed; however, such use is subject to copyright laws and any license or purchase agreement.

MULTIPLYING FRACTIONS

DESCRIPTION

Title: Multiplying Fractions
Author: Don Ross
Publisher: Microcomputer Workshops
Source: c/o CBS Interactive Learning, One Fawcett Place, Greenwich, CT 06836
Subject: Mathematics
Topics: Multiplication of common & improper fractions involving cancellation
Components: 1 diskette, backup, guide (2p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monochrome monitor
IBM PC family, 64K, monitor
Other Formats Available (not evaluated): Commodore 64, Pet, TRS-80, Atari
Alberta Education Call No.: QA 117 M961 198-

Version: 1982
Display Language: English
Cost: $24.95 U.S. (1985)
Tel. #: (203) 622-2500
Users : Grades 7 - 8

OBJECTIVES

To give students in grades 7-8 drill and practice in multiplying fractions.

To facilitate the understanding of the cancelling or reducing process in order to simplify the problem.

PEDAGOGICAL CONTENT DESCRIPTION

The program provides drill and practice on the procedures for multiplying two fractions where cancellation may or may not be possible.

The program contains a set of instructions on how the screen will look, the operations that the user may choose and how a problem may be solved using the program. These instructions deal with running the program and do not involve explanations on the concepts involved. One example is provided.

Following the instructions, the user is given random multiplication problems. In order to solve the question, the user must decide whether to cancel/reduce or multiply. Upon inputting the correct operation, (s)he must then perform the operation. The computer modifies the question appropriately and then resumes the solution process. If possible, final answers are to be converted to mixed numbers.

The user decides at the end of each problem whether another question is to be posed.

PEDAGOGICAL CONTENT EVALUATION

The instructions are intended to demonstrate how to use the program. Their lack of depth and clarity would be inadequate to teach the concept to a student who has not had prior instruction.

The range and sequence of the content are very limited in that only one small skill is addressed and there is no development of sequence within that objective. While that one operation has been covered well, the value of the diskette would be greater with a wider range. The depth of the practice is satisfactory as the user may select as many questions as (s)he desires.

The structured problem solving strategy is a strength of the program. The program is remedial in nature and requires previous instruction in the concept. For that purpose, the content is well developed.

INSTRUCTIONAL FORMAT DESCRIPTION

Correct answers result in the program proceeding through the solution process until an answer is obtained. Errors in either the selection of the correct operation or in the input of numbers result in a brief remedial statement. These statements may direct the user to the correct operation or may show a numerical calculation. The correct answer must be entered before the user can proceed.

At the end of each question, quantitative feedback is given showing the number of procedural errors and the number of computational errors. At the end of the drill, similar quantitative feedback is available for all the questions attempted.

The rate and number of questions are controlled by the user. Questions are randomized and the user may do as many as (s)he wishes.

INSTRUCTIONAL FORMAT EVALUATION

The student interaction in the drill is effective and clear. As the user participates through a very structured problem solving approach, this program would be best for remedial purposes. After a user has mastered this skill, the continued repetition of the structured questions could become tedious.

The feedback on errors is good as corrective feedback is used to explain why an error was made. Error trapping has been well designed and common errors are all anticipated.

Quantitative feedback, while available, does not provide the teacher with specific areas of difficulty. Also some mention of the total number of questions attempted should be included.

Another weakness is the lack of an evaluation component (pre-test/post test) and the lack of different levels of difficulty. These would provide more flexibility in dealing with students with varying abilities.

In general, the instructional format of this drill is good.

TECHNICAL CHARACTERISTICS DESCRIPTION

Text and numbers are presented in standard size print, upper case letters only. During the solution of the question, the screen is broken into three areas: original problem, work space and messages. As the question is solved, the work space is modified but the original question remains untouched. The messages area provides instructions and information to the user.

The inverse mode is used to highlight important pieces of information.

TECHNICAL CHARACTERISTICS EVALUATION

The screen has been well formatted. The use of the three parts allows necessary information to be retained, transformations to be shown clearly and messages to be clearly and efficiently shown to the user.

The technical design of the program is good.

SUMMATION

This program meets its specific objective very well. Content depth, feedback techniques and technical design are all very good. The diskette is very user friendly and could be used with minimal teacher supervision. The methodical step by step approach used to solve the problems requires the student to actively participate in the solution. This is an excellent program for remediation.

The limited content range is a disadvantage and the structured approach may be boring to students who have the necessary skills. Also the quantitative feedback could provide more information to the teacher. These weaknesses are minor when compared to the overall quality of the program.

APPLE - IBM VERSIONS

Both the Apple and IBM versions offer equivalent content and instruction. The IBM version however does offer minor technical enhancements. The IBM version also requires that DOS be saved on the disk upon initial use of the program (note that either DOS 1.1, 2.0 or 2.1 will work).

STATUS

The Apple and IBM versions of "Multiplying Fractions" have been designated as **SUPPLEMENTARY** learning resources for grades 7-8.

PURCHASE INFORMATION

This product may be purchased for $29.95 U.S (1985) from CBS Interactive Learning at the address given at the beginning of the report. Lab packs are available in the following quantities and prices: 10 copies @ 3 x list price; 15 copies @ 4 x list price; 20 copies @ 5 x list price; 25 copies @ 6 x list price. The company provides a life time guarantee against defective diskettes and will replace worn out diskettes without charge at any time.

The diskette has the advantage of being capable of operation with more than one machine at a time; however, such use is subject to copyright laws and any license or purchase agreement.

NUMBER FARM

DESCRIPTION

Title: Number Farm
Author(s): Neosoft Inc.
Publisher: Developmental Learning Materials
Source: P.O. Box 4000, One DLM Park, Allen, Texas 75003
Subjects: Early childhood, mathematics
Topics: Numerical order, number recognition, keyboarding skills, problem solving
Components: 1 disk, user's guide (10p.), cue card (1)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, colour monitor preferred
Other Formats Available (not evaluated): IBM PC/PCjr, Commodore 64

Version: 1984
Display Language: English
Cost: $29.95 (1986)
Tel. #: (214) 248-6300
Users: Grade 1

OBJECTIVES

This disk is designed to acquaint students with the concept of numbers, numerical order, recognition of numerals and number words, keyboarding skills and problem solving.

PEDAGOGICAL CONTENT DESCRIPTION

This disk contains six activities designed to teach number recognition and counting skills:

NUMBER FARM: Students press any number from 1 - 9 and a corresponding number of animals appear on the screen.

OLD McDONALD: A portion of the tune "Old McDonald" is played and the corresponding lyrics appear at the top of the screen. When the song stops, the user counts the number of animals depicted on the screen and enters that number in order to finish the tune.

CROP COUNT: Students count the number of fruit and vegetable crops shown on the screen. This is a timed activity visually depicted by sunrise to sunset.

HEN HOUSE: Two players take turns guessing the number of eggs in the hen house. Clues are given for incorrect responses in the form of "less than" or "more than".

ANIMAL QUACKER: A variety of animals appear on the screen and make sounds. The student listens, counts the number of times the sound is repeated, and enters that number.

HORSESHOES: A number from 1 - 9 is depicted on the screen. Students activate the farmer's son to throw a corresponding number of horseshoes by pressing the space bar an appropriate number of times.

Optional textual instructions and sound are available for each program. A cumulative score is presented at the end of each section of questions.

PEDAGOGICAL CONTENT EVALUATION

Although users can access the programs in any order from the menu, playing them sequentially results in logical progression from number recognition to visual counting to audio counting to problem solving. Content range and depth are appropriate for the target audience. Careful attention has been paid to color coding, visual cueing and graphics to limit the need to read the textual phrases.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of menu selection, number input, and use of the space bar and RETURN key. Questions are randomly selected. Feedback is given visually and in the form of a score. Users are generally given two attempts per question, after which the correct answer is shown. Quantitative feedback in the form of filled milk bottles and scores is given after each question segment. Sequence is initially controlled by the user via menu selection; however, once in an activity, sequence is program controlled. Amount is limited to five questions per activity; rate is user controlled.

INSTRUCTIONAL FORMAT EVALUATION

The option of having textual instructions displayed is appropriate, for they are designed to be read by an older student/adult as they are well beyond the reading ability of the target audience. Visual cues are excellent, and students should experience no difficulty once they have been initially acquainted with program operation. Limiting the questions to five per game is appropriate for the attention span of the target audience.

TECHNICAL CHARACTERISTICS DESCRIPTION

Color, animated graphics and optional sound are employed in all programs. High resolution graphics are used for large number depiction.

TECHNICAL CHARACTERISTICS EVALUATION

Displays are very effective and clear. Animated graphics provide excellent cueing and the use of color adds interest and clarity. Although sound can be disabled, the lively, varied tunes add appeal. Character size and font are appropriate for the target audience.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

The ten page teacher's guide provides initial operating instructions, explains the options of instruction display and sound use/disable, and includes detailed program descriptions together with suggested implementational activities.

A one page student guide illustrates the numbers 1 - 9 in numerical and written form accompanied with a corresponding number of animals.

IMPLEMENTATIONAL SUPPORT EVALUATION

The support materials are clear and well organized, however the program itself is so user friendly that support materials are hardly needed.

SUMMATION

This program makes excellent use of animated, colored graphics to present initial number familiarity concepts.

STATUS

"Number Farm" has been designated as a **SUPPLEMENTARY** learning resource for grade 1.

PURCHASE INFORMATION

This product may be purchased for $29.95 US (1986) from Developmental Learning Materials at the address given at the beginning of the report. It may also be purchased for $41.95 (1985) from PMB Industries, 1220 Ellesmere Rd., Scarborough, Ontario M1P 2X5 (416) 298-2611. Disks which become inoperable for any reason will be replaced without charge within a six month warranty period. There is no further warranty but replacements may be obtained from Developmental Learning Materials for $25.00 U.S.

Due to frequent disk interaction, this product may be used with only one computer at a time.

OIL DROP

DESCRIPTION

Title: Oil Drop
Series: Physics Interact
Author: James Friedland
Publisher: Edutech
Source 303 Lamartine St., Jamaica Plain, MA 02130
Subject: Science
Topics: Millikan Oil Drop Experiment
Components: 1 disk, backup, user's guide (7p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, game paddles, color monitor optional
Other Formats Available (not evaluated): Available in Apple format only

Version: 1981
Display Language: English
Cost: $75.00 U.S. (1985)
Tel. #: (617) 524-1774
Users : Grade 12

OBJECTIVES

This disk is designed to:

1. Provide students with an opportunity to discover the discrete nature of elementary charges.
2. Develop an understanding of the mechanics of a classic experiment and the calculations involved in it.

PEDAGOGICAL CONTENT DESCRIPTION

This disk presents two versions of Millikan's Oil Drop Experiment. In the first version, students are given the mass of an oil drop from which they must calculate the charges necessary for the drop to maintain equilibrium between the electrostatic and gravitational forces. In the second version students are given only the radius of an oil drop. They must therefore first calculate the mass and then go on to calculate the necessary charges for equilibrium balance.

PEDAGOGICAL CONTENT EVALUATION

The Millikan Oil Drop Experiment accurately portrays a classical experimental procedure. Since students can select as many oil drops as they wish on which to make measurements and calculations, both the range and depth of the material are appropriate and sufficient. The content and models used in the simulation are accurate and valid.

Teachers should note that there is no instructional component on the disk. While there is a brief explanation in the guide, pre-instruction in the concepts involved would be necessary.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of name input, using the game paddles to adjust stopping voltages, and entering both numerical and textual answers to a variety of questions related to the operation of the program. Feedback consists of textual reinforcement for correct responses or a suggestion to redo a calculation if an error is made. If the teacher so chooses, each student's experimental results may be printed and displayed.

INSTRUCTIONAL FORMAT EVALUATION

Interaction during the program is dependent upon the student having access to game paddles. It is unfortunate that keyboard entry is not possible. Also, the instructions on the use of the game paddles are somewhat brief and are now inappropriate for current joy sticks.

As each run through the simulation will produce different 'oil drops', the questioning technique allows the program to be re-run a number of times. However, all calculations are done by the student with paper and pencil and not on screen. Thus, there is no opportunity for the computer to guide the student through the process or provide diagnosis of the area of difficulty. Feedback comments are brusque and unhelpful. "Recalculate" is not going to help a student who has already recalculated a number of times without success.

The fact that the program both checks the accuracy of an input and records it for subsequent teacher and student perusal is a positive feature.

TECHNICAL CHARACTERISTICS DESCRIPTION

Sound and color are used in the title frames. There is basically just one graphical display--namely a schematic diagram of the experimental apparatus. Text is primarily presented in upper case text.

TECHNICAL CHARACTERISTICS EVALUATION

Technical quality is good. Displays are clear, easy to read, free of errors, and appropriate to the target audience. While color and sound add interest, they are not integral to program operation.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

Support materials consist of a 7 page teacher's guide which provides background information related to the physics involved in the program and describes the use of the management system. The student guide includes both theoretical background and a lab sheet.

The management system maintains class lists, provides individual student score data, allows data from all the students to be compiled and permits individual or compiled data to be printed in table or graphic form for further analysis.

IMPLEMENTATIONAL SUPPORT EVALUATION

Support documentation provides background information necessary to program operation; however, as mentioned earlier, pre-instruction in the classroom is advised. The management system, which has a capacity of about 24 students, is easy to use. The fact that it lists students by last name only and does not provide differentiation by classes is a minor disadvantage.

The capability of the management system to print and compile data enhances the analysis of the experimental data and facilitates the use of the simulation for group or class work.

SUMMATION

This program provides a clear and realistic simulation of Millikan's Oil Drop Experiment. It is possible to acquire simulated data quickly without having to go through actual lab situations. Also, the program checks that the student has an understanding of the experiment by requiring calculations.

It is unfortunate that once the student is beyond the point of obtaining equilibrium and receiving data, the program returns the student to pen and paper mode. At this point, the student receives as much help as receiving the figures on a work sheet and being told to calculate the data on his/her own. The program does provide the teacher with records which may help him/her assist the students who are having difficulty. It is unfortunate however that an instructional component complete with corrective feedback is not provided. The high price for a single disk package is another drawback.

STATUS

"Oil Drop" has been authorized as a **SUPPLEMENTARY** learning resource for Physics 30.

PURCHASE INFORMATION

This product may be purchased for $75.00 U.S. (1985) from EduTech Inc. at the address given at the beginning of the report. Edutech titles may be purchased in money saving quantities of six disks and six manuals for 2.5 times the single item cost.

Defective diskettes will be replaced without charge within a 30 day warranty period. Thereafter, if a disk is damaged for any reason within two years of purchase, it may be returned for a free replacement.

The diskette has the advantage of being capable of operation with more than one machine at a time provided that only one simulation is accessed; however, such use is subject to copyright laws and any license or purchasing agreement.

PALMETTO INSURANCE CO.

DESCRIPTION

Title: Palmetto Insurance Co.
Author: Fleischer, Gates
Producer: South-Western Publishing Company
Source: c/o Gage Publishing Co., 164 Commander Blvd., Agincourt, ON M1S 3C7
Subject: Business Education
Topics: A word processing simulation for an insurance company.
Components: 1 disk & backup, teacher's guide (74p.), simulation (44p.), audio casette
System Requirements: Apple II+/IIe/IIc, 48k, 1 disk drive, monitor, printer
Other Formats Available (not evaluated): TRS-80

Version: 1984
Display Language: English
Cost: $108.65 (1986)
Tel. #: (416) 293-8141
Users : Grades 11 & 12

OBJECTIVES

This package, which simulates the position of a beginning word processing correspondence secretary, is designed to teach students to learn to follow directions, to priorize documents, to budget time, to develop speed and accuracy, and to refine secretarial skills.

CONTENT DESCRIPTION

This simulation represents four days in the work life of an associate correspondence secretary at Palmetto Insurance Company. Each day's work is contained in a packet which requires approximately 4-5 hours to complete (16-20 hours for the entire simulation). The simulation incorporates both longhand and typewritten transcripts of dictation as input and includes letters, memos, reports, form letters, and statistical copy for production jobs. Support materials contain all the supplies needed to complete the activities, four folders to be used to sort and store work in progress, an Employee's Guide and Procedures Manual which provides students with written task instructions, and an Employer's Guide which provides background information about the insurance company, specific instructions for standardized procedures used, a reference section, and a glossary of word processing terminology.

CONTENT EVALUATION

This package is self-contained and self-instructional and therefore lends itself to either individual or group instruction. Students must have typing skills as a prerequisite to using this simulation.

The package represents a realistic simulation of the types of jobs a word processing secretary would encounter, however American bias (in addresses, references, etc.) is evident. Work packets are effective in encouraging students to think for themselves, to organize the word processing to be done, and to priorize material. Since each packet contains representative work of a typical day in an office, it provides a realistic business simulation for students and encourages them to allocate time and resources effectively. Provided classes have the necessary equipment, teachers can add to the realism by purchasing a cassette tape containing the dictation scripts.

Since only limited word processing functions are incorporated on the disk, students may not obtain a realistic exposure to the merits of word processing over typewritten copy.

The package is well-sequenced. The emphasis in packets 1 and 2 is on learning correct procedures and gaining experience in making decision and setting priorities. In addition to these skills, packets 3 and 4 require the student to log work and measure productivity. If completed in its entirety, this simulation meets its objectives and students should experience improvement in keyboarding skills, proofreading ability, familiarity with word processing terminology, and ability to follow directions, organize and make effective decisions.

INSTRUCTIONAL FORMAT DESCRIPTION

Students use the Employee's Guide to obtain information about the Palmetto Insurance Company, to determine their role in the organization, and to read task instructions (similar to information provided on "in basket" production jobs which may be generated in an office setting). Required supplies, forms, letterhead paper, etc. are included in each of the four work packets. The disk is accessed to retrive documents which need alteration or to generate short letters and memos. Students must have access to a typewriter in order to generate the required tables and envelopes.

While the disk provides feedback relevant to disk command errors, there is no assessment made of individual tasks. Quantitative feedback must be provided by the teacher when production jobs are completed at the end of each "day" or at the end of the "week" (i.e. 20 hour simulation period). Suggested grading schemes are provided in the Employer's Guide.

INSTRUCTIONAL FORMAT EVALUATION

This package contains explicit instructions for use, and after an initial introduction by teachers, students should be able to use the package independently. Since students are expected to read and follow task assignments and instructions for completion as outlined in the Employee's Guide, the package does place a heavy reliance on reading and comprehension; therefore, students with weak skills in this area may require teacher assistance.

Questioning and feedback do not form a significant part of this program. Rather, the student uses the word processing features of the disk to generate hard copy output which is then given to the instructor for evaluation.

The disk itself is supplementary to the program--it adds interest and realism (e.g. stored documents can be called up for changes and corrections), but the documentation provides the "meat" of the instruction.

TECHNICAL DESIGN DESCRIPTION

Standard size combination upper and lower case text is used. Graphics, color, or sound are not included.

TECHNICAL DESIGN EVALUATION

While this package attempts to simulate a word processing situation, the limitations imposed by incorporating student instructions as well as word processing ability using Applesoft Basic and a 60 character string to store information causes the program be awkward to use. The disk is not a full fledged word processing program, but rather incorporates only those word processing capabilities necessary to produce short letters and memos. It therefore has the limitations of not offering tabulation features, editing is restricted to one line at a time, it does not permit use of the apostrophe or underscore keys, there is no provision for justification or centering of lines, cursor movement in the "insert" mode is slow, etc. Furthermore, only two print forms of output are available: a block letter and a memo with built in defaults, thus a student never gets exposure to the strengths of the word processor in terms of instant change of margin settings, line spacing, etc. This also means that students must have access to typewriters to complete other parts of the simulation (e.g. tables, envelopes).

IMPLEMENTATIONAL SUPPORT DESCRIPTION

The 44 page Employee's Guide provides orientation to the company, a description of the tasks expected of a word processing secretary, and outlines all tasks and procedures to be followed for the production jobs. Necessary forms, letterhead, etc. are provided in the four work packets.

The Employee's Guide provides implementational suggestions, includes an answer key for all jobs, and gives suggested evaluation procedures.

IMPLEMENTATIONAL SUPPORT EVALUATION

The packages of assignments are appropriate for the target audience. Once students have become familiar with the command codes, the program is simple to use and requires minimal teacher supervision.

SUMMARY STATEMENT

Although it would be expensive to use in a full class setting, this package does provide an effective simulation of a word processing secretary's role in an insurance office. It must be emphasized that the purpose of this program is not to teach word processing--indeed the word processing component of the package is very limited in power and is not comparable to a dedicated word processing system. Rather, the goal of the package is to provide students with a simulated business experience in which they must apply the skills of being able to read and follow directions explicitly, make accurate decisions, priorize items, work under time restraints, proofread documents accurately, etc., and these objectives are fulfilled if the package is completed in its entirety.

Effective program implementation does require considerable time investment on the part of the teacher in order to gain initial familiarity with the business situation represented.

STATUS

"Palmetto Insurance Company" has been authorized as a **SUPPLEMENTARY** learning resource for Typewriting 20/30 and Office Procedures 20/30.

PURCHASE INFORMATION

A single complete package may be purchased for $108.65 (1986) from Gage Publishing Company at the address given above. Individual component prices are: disk - $58.50, simulation set - $12.25, teacher's manual - $9.20 and audio casette - $28.70. The program could be used with a teacher prepared audio casette.

Defective diskettes will be replaced without charge within a 90 day warranty period. There is no warranty for diskettes which become inoperable through normal usage.

Note that classroom use will require each student to have his/her own set of simulation materials. Also, a disk can be used by only one student at a time; however, after the student has completed the full simulation, data can be erased and it may be used by other students.

PARABOLIC MOTION

DESCRIPTION

Title: Parabolic Motion
Series: Physics CompuLab
Author: Alan Cromer
Publisher: EduTech Inc
Source: 303 Lamartine St., Jamaica Plain, MA 02130
Subject: Science
Topics: Speed & acceleration in parabolic motion, acceleration of gravity.
Components: 1 disk, backup, user's guide (13p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, color monitor preferred, games paddles, stop watch, ruler. In addition a graphics interface/printer card such as "PKASO" or "GRAPPLER +" is needed.
Other Formats Available (not evaluated): Available for Apple only.

Version: 1983
Display Language: English
Cost: $75.00 U.S. (1985)
Tel. #: (617) 524-1774
Users : Grade 10

OBJECTIVES

Students will be able to:

1. Observe that in parabolic motion an object moves with constant speed in the horizontal direction and with constant linear acceleration in the vertical direction.
2. Measure the acceleration of gravity in parabolic motions with different initial conditions.
3. Perform the Hunter-Monkey demonstration.

CONTENT DESCRIPTION

This program consists of three simulated motion experiments involving both horizontal and vertical motion components and including the effects of gravity:

1. HORIZONTAL PROJECTIONS - The user fires a projectile at four different speeds for each of three different heights. The student uses a stopwatch and ruler to time and measure each of the twelve trails, tabulates the results and calculates an average value "g" value.

2. ANGULAR PROJECTIONS - After timing and measuring twelve experiments involving the angle of firing and displacements, users again tabulate, graph and calculate "g".

3. HUNTER AND MONKEY - This simulation involves a hunter who aims his rifle at a monkey hanging in a tree and the monkey, seeing the flash of the rifle, drops from the tree at the instant the rifle is fired. This scenario is used to generate calculations which demonstrate that horizontal and vertical motions are independent.

The 13 pages of student support material provide an explanation of operating procedures, sample analyses of problems and user report sheets.

CONTENT EVALUATION

Content range is appropriate for the target audience and availability of twelve experiments to demonstrate each principle provides sufficient depth. Although the documentation suggests a definite sequence, menu selection allows a student to complete the simulations in any order. If desired, the teacher can control the number and magnitude of the parameters the students use. The content is accurate and the presentation of gravitational influence under a reduced gravity situation is effective in enabling users to time individual events. Since the disk itself contains no instructions or questions to test student understanding, the use of the student support sheets is mandatory, and program objectives would be met only if the disk and support materials were used conjunctively.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of pressing the space bar to activate page turns, hitting a designated letter or number for menu selection, using game paddles to control the parameters (height, velocity, angle) and firing of projectiles, and using a stopwatch and ruler to measure time and distance.

The program itself does not provide any questioning relating to the theory of the experiments nor does it provide feedback or evaluation of results. Student support materials however do provide operating instructions, clarifying examples, and data record sheets.

INSTRUCTIONAL FORMAT EVALUATION

This program is designed to act solely as a data generator for the study of parabolic motion, thus the absence of questions or evaluation within the program itself is not a drawback. Student interaction is appropriate and meaningful. When used in conjunction with the student worksheets, this program does a good job of using concrete examples to illustrate abstract principles.

It is assumed that students using this program would have received prior instruction in Newtonian physics (velocity, distance, acceleration and time relationships).

TECHNICAL DESIGN DESCRIPTION

This program uses the high resolution screen to produce colored graphics. Sound is used to simulate the firing of projectiles. Hardcopy printouts are theoretically possible. Game paddles, a stop watch, and a ruler are essential to program operation.

Calibrating the printer and monitor is necessary in order to ensure accurate measurements. In order to calibrate the printer, a graphics/printer interface card such as the PKASO, SILENTTYPE or the GRAPPLER + is necessary. The calibration routine is accessed via the main menu for both the printer and the monitor. Once these are completed, the selections are saved to disk.

TECHNICAL DESIGN EVALUATION

Although this program utilizes color, using a monochrome monitor is not a disadvantage. Screen displays are clear and easy to read. Although the program requires the manipulation of game paddles, stop watches, and rulers, most high school students are quite capable of operating the program with a minimum of difficulty and supervision.

The documentation indicates that it is possible to generate hard copy printouts of screen displays, however the required printer interface is not adequately explained. Further information on the types of interfaces that can be used and on the calibration of printers and monitors is needed. Evaluators indicated that they had problems with both calibrations.

SUMMARY STATEMENT

The simulations contained on this disk make good use of the computer's capabilities to generate data to study parabolic motion. Prospective purchasers should be aware of the additional hardware that is required and the need for appropriate printer/graphics interface cards.

STATUS

"Parabolic Motion" has been authorized as a SUPPLEMENTARY learning resource for Physics 10.

PURCHASE INFORMATION

This product may be purchased for $75.00 U.S. (1985) from EduTech Inc. at the address given at the beginning of the report. Edutech titles may be purchased in money saving quantities of six disks and six manuals for 2.5 times the single item cost.

Defective diskettes will be replaced without charge within a 30 day warranty period. Thereafter, if a disk is damaged for any reason within two years of purchase, it may be returned for a free replacement.

The diskette has the advantage of being capable of operation with more than one machine at a time provided that only one function is accessed; however, such use is subject to copyright laws and any license or purchasing agreement.

PERCENTS

DESCRIPTION

Title: Percents
Author: Contemporary Perspectives Inc.
Publisher: Media Materials (previously Milton Bradley)
Source: 2936 Remington Ave., Baltimore, MD 21211
Subject: Mathematics
Topics: Percentage problems
Components: 1 disk, teacher's guide (35p.), 26 reproducible worksheets
System Requirements: Apple II+/IIe only, 48K, 1 disk drive, color monitor preferred
Other Formats Available (not evaluated): Available only in Apple Format
Alberta Education Call No.: QA 117 P428 1983

Version: 1983
Display Language: English
Cost: $49.95 U.S. (1985)
Tel. #: (301) 235-1700
Users : Grades 6 - 9

OBJECTIVES

As a result of using this program, students will be able to solve various kinds of percentage equations and problems.

PEDAGOGICAL CONTENT DESCRIPTION

This package begins with three readiness speed drills (Rewriting Percents as Fractions, Solving Simple Equations and Solving Simple Proportions) which are pre-requisites to the following five skill areas:

1. Finding a Percent of a Number: Students calculate the amount of discount that will be given on the purchase of a pair of shoes.
2. Finding a Base Number: Students determine the percents and the amounts of weekly commission for different salespeople.
3. Finding a Percent: Using the context of Jane's field goal record in basketball (number of shots taken and the number of baskets), students calculate the percentage one number is of another.
4. Solving Percent Problems: Given a table of quizzes that shows two out of three numbers (the total number of quiz items, the number correctly answered or the percent score), students determine and solve the missing number.
5. Solving Two-Step Percent Problems: Students determine the amount of change due and then express this figure as a percentage of the original quantity.

Each program is available in three learning modes: mastery (test mode), practice and instruction. The mastery mode is a timed drill where correct answers are supplied as feedback to incorrect responses, but no help is available; the practice mode has a help mode which shows the student the solution to a similar type of problem; the instruction mode provides step-by-step direction in working through the question and arriving at the correct answer. Through use of the Student Record Manager, teachers can control student progress through the skill areas.

PEDAGOGICAL CONTENT EVALUATION

The range and sequence of this program are appropriate for the target audience and are effective in promoting the acquisition of basic percentage skills. Content is presented in a clear, well-sequenced manner. Since the teacher assigns the appropriate learning modes based upon the students' pre-test scores and has the option of assigning any or all of the three learning modes available, sufficient depth is assured.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of menu and mode selection, entry of numerical answers, and use of RETURN to activate page turning. Questions are randomly generated from a limited data bank and are sequenced from easy to difficult. Feedback is given after each student response: a correct answer results in a short, randomly generated positive comment; an incorrect answer receives a comment such as "Try again" together with a line drawn through the error. A help avenue is available in the practice and instruction modes. (In the practice mode the help screen shows possible solutions to a similar type of problem; in the instruction mode step-by-step guidance in working through a problem is given). Quantitative feedback is given at the end of each drill. Although rate is user controlled, amount is program controlled (five questions in each skill area). Sequence can be teacher controlled via alterations to the Student Record Manager.

INSTRUCTIONAL FORMAT EVALUATION

The instructional technique is generally appropriate and effective with sufficient student interaction to meet the objectives of the program. Pre-tests are directly related to computer program content. The provision of three learning modes in each skill area plus a well designed help avenue adequately accommodates individual differences. Feedback is immediate and often corrective; however, it is quite limited in variety and scope. For example, it provides assistance in setting up an appropriate proportion or equation, but the student is expected to have the skills necessary to solve it from that point on. Occasionally positive comments are inappropriately given when a student has performed poorly.

TECHNICAL CHARACTERISTICS DESCRIPTION

Sound is used to simulate the ticking of a clock in the readiness section. Color is used in the graphics (a boy on a raft), and on borders around displays. Standard size, upper/lower case print is used for most of the text with enlarged lettering for titles, problem presentation, and scoreboard. Flashing lettering is used to draw attention to important messages.

TECHNICAL CHARACTERISTICS EVALUATION

Displays are clear and appropriate for the target audience and transition from one display to another is usually smooth. The graphics used in the readiness drills are interesting but, if the user wins, too time-consuming. Color adds interest but is not mandatory to program operation. Unfortunately the program makes no provision against accidental hitting of the RESET or ESCAPE keys which causes it to malfunction. Also, the program version that we had did not work on an Apple IIc. As our copy was a 1983 version, subsequent revisions may work on a IIc.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

The Student Record Manager with a maximum capacity of 125 names provides the options of adding/deleting students, viewing/changing students on file, changing levels, and running lessons. After evaluating the results of pre-test scores, teachers can assign one of three entry levels to each student. It is possible to circumvent the management system and access drills directly from a menu.

Reproducible student materials consisting of three sets of tests, twenty instruction and practice worksheets, student record sheets, and a class record sheet are provided.

IMPLEMENTATIONAL SUPPORT EVALUATION

The functioning of the management system is clearly outlined in the guide and steps must be adhered to closely to ensure proper operation. Unfortunately the management system does not fully utilize the computer's capacity--all records have to be manually maintained on student record sheets; the updates are then entered into the computer.

Student support materials are effective for reinforcement and evaluation, although they do contain some additional question types to those presented on the computer program.

SUMMATION

The major strengths of this program are the sequential presentation of percentage concepts, the high quality user support materials, the availability of three different learning modes (including help routines), and the active student interaction. Weaknesses include a poorly designed management system, lack of control over the amount of questions done in any program, and rather slow program movement.

STATUS

"Percents" has been designated as a **SUPPLEMENTARY** learning resources for grades 6-9.

PURCHASE INFORMATION

This product may be purchased for $49.95 U.S. (1985) from Media Materials at the address given at the beginning of the report. Defective diskettes will be replaced at no charge for as long as the product is available. Backup diskettes are available for $20.00 U.S. (1985)

Due to frequent disk interaction, this product may be used with only one computer at a time.

PERIODIC MOTION

DESCRIPTION

Title: Periodic Motion
Series: Waves and Vibrations
Author: G. MacRae
Publisher: Merlan Scientific
Source: 247 Armstrong Ave., Georgetown, ON L7G 4X6
Subject: Science
Topics: Periodic motion, cycle, longitudinal & transverse vibration, amplitude, phase, period and frequency
Components: 1 disk and backup, user's guide (3p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monochrome monitor, stop watch
Other Formats Available (not evaluated): Commodore Pet & 64

Version: 1983
Display Language: English
Cost: $41.00 (1985)
Tel. #: (416) 877 - 0171
Users : Grade 11

OBJECTIVES

The student will be able to:

1. State the meaning of periodic motion and distinguish between transverse and longitudinal motion.
2. Demonstrate an understanding of the term cycle by identifying the number of cycles after observing a vibrating motion.
3. Give the time for a periodic motion after observing an example of the number of cycles.
4. Calculate frequency after being given time and number of cycles.
5. Given either frequency or period, calculate the missing quantities.
6. Given a diagram showing the path of a vibrating body, determine the amplitude of the motion.
7. Given similar vibrating motions, determine whether they are in phase, in opposite phase or out of phase.

PEDAGOGICAL CONTENT DESCRIPTION

This module contains 5 lessons on periodic motion which the user selects from a menu. Each lesson follows the general format of giving a definition of the situation, providing animated graphic examples to illustrate the definition and posing questions to test the user's understanding of the concept. In the event of a wrong response, the user is either given a detailed explanation of the correct response or is requested to re-do the problem. Each lesson closes with a review of the major terms and objectives of the lesson.

PEDAGOGICAL CONTENT EVALUATION

Content is clearly presented, is accurate and is directed to the stated objectives. The program makes the assumption that the user will progress through the lesson in sequence - a practice that the teacher should ensure. The use of animated graphics to display a point or to present a question is of great value.

Minor weaknesses are:

1. The graphing of a cycle, using a sine wave, is not explained to the user. Some confusion may arise when this 'back and forth' motion is spread out over time.
2. There are occasions when questions are posed before detailed demonstrations are presented and the user must answer them based on the definitions alone. This is not entirely inappropriate for this target audience.
3. There is some lack of depth, e.g. in the exercise portion of 1-2, the piston or pendulum always starts from the same position.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of selecting from the menu, pressing space bar to advance a frame, entering yes/no responses to various questions, entering a single word to complete a phrase, entering a numerical value based upon data extracted from the program and choosing correct items from a multiple choice list. Questions are presented in a fixed sequence.

Positive feedback consists of the presentation of a variety of expressions. Incorrect answers result in an indication that the user was wrong followed by re-presentation of the question or the program may instead go through the solution for the user. In some sections the user must obtain three correct responses in a row before being permitted to advance to the next section.

INSTRUCTIONAL FORMAT EVALUATION

The amount of student interaction is sufficient and is effective in testing the student's grasp of the items under study. Inputs are accurately evaluated as right or wrong and spelling errors are also usually recognized.

The use of a stop watch followed by data entry is an effective way of simulating an actual experiment. However, a stop watch must be available - the user can not pass over this section.

Negative feedback is reasonably good in that solutions to the questions are shown.

One weakness is the non-randomization of the questions. Also, it is possible for a student to be trapped in a lesson if (s)he can not answer three questions in a row.

TECHNICAL CHARACTERISTICS DESCRIPTION

Animated graphics are used to demonstrate the concepts. A high resolution generated character set is employed to present text.

TECHNICAL CHARACTERISTICS EVALUATION

The technical aspects of the program are excellent and the program is easy to operate.

SUMMATION

The program is not intended to replace 'hands on' work in the laboratory. However, the lessons are well done and will meet their objectives of providing an introduction to periodic motion. Weaknesses are minor only and do not detract from the overall effectiveness of the package.

STATUS

"Periodic Motion" has been designated as a **SUPPLEMENTARY** learning resource for Physics 20.

PURCHASE INFORMATION

This disk is part of a series and may be purchased for $41.00 (1985) from Merlan Scientific Ltd. at the address given at the beginning of the report. The entire series may be purchased for $150.00 It consists of 6 modules: "Periodic Motion"; "Waves in a Linear Medium - Introduction"; "Waves in a Linear Medium - Superposition"; "Periodic Waves - Basic Concepts"; "Longitudinal Wave Demonstrator"; and "Wave Demonstrations". All of these have been authorized as Supplementary resources and reports on them are contained in this document.

Defective diskettes will be replaced without charge within a one year warranty period. Disks which become inoperable through normal use may be replaced for $15.00.

This disk has the advantage of being capable of operation with more than one machine at a time for a particular lesson; however, such use is subject to copyright laws and any license or purchase agreement.

PERIODIC WAVES: BASIC CONCEPTS

DESCRIPTION

Title: Periodic Waves: Basic Concepts
Series: Waves and Vibrations
Author: G. MacRae
Publisher: Merlan Scientific
Source: 247 Armstrong Ave., Georgetown, ON L7G 4X6
Subject: Science
Topics: Periodic waves, wavelength, amplitude, period and frequency.
Components: 1 disk and backup, user's guide (3p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monochrome monitor, stop watch
Other Formats Available (not evaluated): Commodore Pet & 64

Version: 1983
Display Language: English
Cost: $41.00 (1985)
Tel. #: (416) 877 - 0171
Users : Grade 11

OBJECTIVES

The student will be able to.

1. Define a transverse wave.
2. Diagram a transverse wave as to crest and troughs.
3. Define the wavelength and amplitude of a transverse wave.
4. Determine the number of wavelengths, speed and/or frequency given the number of cycles executed by a source or a point in a medium.
5. Define a longitudinal wave in terms of motion of points in a medium.
6. Identify the wavelength, compressions and rarefractions of a longitudinal wave.

PEDAGOGICAL CONTENT DESCRIPTION

This module contains 4 lessons on waves which the user selects from a menu. These are:

1. An animation dealing with transverse waves and definitions of the same
2. An animation dealing with wavelength, amplitude, frequency and period definition
3. Graphics and calculations using a stop watch for finding frequency, wavelength and speed when given two of the three variables
4. An animated graphics section dealing with definitions associated with longitudinal waves, wavelengths, compressions and rarefractions.

Lessons consist of the presentation of animated graphic displays followed by questions to the student and a summary of terminology.

PEDAGOGICAL CONTENT EVALUATION

The range, sequence and depth of the topics are appropriate for the target audience.

Content is accurate; however, clarity is somewhat weak in the animated graphic sections on compression and rarefraction and the unit on the transverse wave concept. The explanations are insufficient and the user may be left with the impression that the medium is moving in the same direction as the wave.

The success of the program relies to a certain extent on the user having completed earlier programs in the series.

INSTRUCTIONAL FORMAT DESCRIPTION

Using a tutorial type mode, the user is required to push the space bar to advance frames and to enter one word answers or numerical answers as obtained from stopwatch timings. The user is required to perform different tasks every few frames.

Questions come in a preprogrammed order or randomly from a limited data bank. If the user makes a mistake, the program will supply the student, in a majority of cases, with a detailed explanation. More problems of a similar type may then be presented.

INSTRUCTIONAL FORMAT EVALUATION

The amount of student interaction is sufficient, varied and effective in testing the student's grasp of the items under study. Feedback is generally good. No provision is made in the program to analyze errors but an explanation is given when errors are made. Quantitative feedback would be advantageous.

TECHNICAL CHARACTERISTICS DESCRIPTION

Animated graphics are used to demonstrate the concepts. A high resolution generated character set is employed to present text.

TECHNICAL CHARACTERISTICS EVALUATION

The technical aspects of the program are very good and the program is easy to operate. The illusion of movement for particles in the medium for transverse waves may create some difficulty for the user.

SUMMATION

In general the use of animation to present various concepts about waves and their behaviour is very well done and is a good use of the computer medium. The program should be moderately motivational to the user and would be considerably better than static textual material.

Minor weaknesses are the questioning techniques (fixed order or limited data bank only) and the lack of error analysis.

STATUS

"Periodic Waves: Basic Concepts" has been designated as a **SUPPLEMENTARY** learning resource for Physics 20.

PURCHASE INFORMATION

This disk is part of a series and may be purchased for $41.00 (1985) from Merlan Scientific Ltd. at the address given at the beginning of the report. The entire series may be purchased for $150.00 It consists of 6 modules: "Periodic Motion"; "Waves in a Linear Medium - Introduction"; "Waves in a Linear Medium - Superposition"; "Periodic Waves - Basic Concepts"; "Longitudinal Wave Demonstrator"; and "Wave Demonstrations". All of these have been authorized as Supplementary resources and reports on them are contained in this document.

Defective diskettes will be replaced without charge within a one year warranty period. Disks which become inoperable through normal use may be replaced for $15.00.

This disk has the advantage of being capable of operation with more than one machine at a time for a particular lesson; however, such use is subject to copyright laws and any license or purchase agreement.

PIECE OF CAKE

DESCRIPTION

Title: Piece of Cake
Author: None cited
Publisher: Springboard Software Inc.
Source: 7808 Creekridge Circle, Minneapolis, MN 55435
Subject: Mathematics
Topics: Addition, subtraction, multiplication and division of whole numbers
Components: 1 disk, teacher's guide (6p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, color monitor
Other Formats Available (not evaluated): IBM PC, Atari, Commodore 64

Version: 1983
Display Language: English
Cost: $34.95 U.S. (1985)
Tel. #: (612) 944-3915
Users : Grades 1-6

OBJECTIVES

This disk is designed to develop speed and accuracy in the recall of basic math facts.

PEDAGOGICAL CONTENT DESCRIPTION

This disk contains five games designed to provide drill and practice in basic arithmetic operations:

1. "The Bakery" provides practice in basic addition and subtraction of numbers up to 20 by visually adding/removing graphically depicted cakes.
2. "Multicake" provides multiplication practice up to 100. The user is shown a cake and is told how many slices the baker plans to make horizontally and vertically. Utilizing multiplication skills, the student determines how many pieces will result.
3. "Dividacake" provides division practice up to 100. The user is told how many pieces of cake are required and the number of slices that have been cut. The student is required to determine how many pieces each slice must be divided into in order to achieve the required number.
4. "Flashcards" presents flashcard types of questions according to the user's choice of problem type (addition, subtraction, multiplication or division) and the level of difficulty (beginner, learner, junior whiz, champion or supermath).
5. "Catchacake" randomly presents addition, subtraction, multiplication and division questions. Up to four students compete against time by attempting to answer the question before a cake, depicted at the top of the screen, falls to the floor.

PEDAGOGICAL CONTENT EVALUATION

Content is presented in a clear and accurate manner. Overall, there is sufficient range for the disk to be appropriate for the specified target audience; however, individual programs may not be appropriate for all ages. For example, seven year olds would likely experience difficulty with the higher levels of "Flashcards" and older students would find "The Bakery", "Multicake" and "Dividacake" somewhat slow and boring.

The program provides for sequencing by allowing a choice of difficulty levels which are adjusted according to the student's success; however, the amount of increment is inconsistent. For example, in "Flashcards" there appears to be very little increment between "Learner" and "Junior Whiz" but a very large increment is noted between the "Champion" and "SuperMath" levels.

INSTRUCTIONAL FORMAT DESCRIPTION

The student selects the program (s)he wishes to do from a choice of a word or a picture menu. After selecting the type of mathematical operation and the level of difficulty (when appropriate), student interaction consists of the entry of a single alphabetic or numeric key as an answer response. Questions are randomly selected and feedback, accompanied by sound, is provided after every response. Positive feedback provides a congratulatory message such as "You did it!"; negative feedback provides visual assistance by including a graphic representation of the problem. A color monitor is required to take full advantage of this assistance. Some of the programs provide evaluation in the form of a percentage score or in accumulated points. Students control sequence and rate (with the exception of "Catchacake" where questions are timed); amount is program controlled.

INSTRUCTIONAL FORMAT EVALUATION

The instructional format is generally appropriate for the target audience with the corrective feedback "Multicake" and "Dividacake" being exceptionally well done. Student input, which consists of single keystrokes, is appropriate; however, no opportunity is given to correct an answer which may have been entered in error. Also, no carrying and borrowing numbers may be entered.

Questions are randomly generated and feedback and evaluation techniques are effective. The timed responses in "Catchacake" encourage students to increase their computational speed. A concern exists with regard to the left to right method of answer entry in the "Flashback" program when dealing with calculations involving two or more digits. This is diametrically opposed to proper mathematical calculation techniques and may inculcate bad habits in students. Furthermore it often necessitates that pen and paper be used for calculations. Also, subtraction questions in the Flashcards program may result in negative answers at the higher levels.

TECHNICAL CHARACTERISTICS DESCRIPTION

This program uses sound both as a reinforcement and as an accompaniment to high resolution graphic movement. Color is also utilized.

TECHNICAL CHARACTERISTICS EVALUATION

Displays are well formatted with effective use being made of color and graphics. The fact that sound cannot be disabled is a program liability.

SUMMATION

The program provides a variety of motivational methods for directing basic math drill and practice routines for students.

STATUS

"Piece of Cake" has been authorized as a **SUPPLEMENTARY** resource for grades 1-6.

PURCHASE INFORMATION

This product may be purchased for $34.95 U.S. (1985) from Springboard Software at the address given at the beginning of the report. A backup diskette may be purchased for $12 U.S.

If within 30 days of the date of purchase, the owner decides that the software is not helping to develop the child's creative skills, Springboard will refund the purchase price. Defective diskettes will be replaced without charge within a 30 day warranty period. After 30 days, a replacement for a defective diskette can be obtained by sending the original product and $5.00 to the manufacturer provided that an extended warranty card has been filed.

The diskette has the advantage of being capable of operation with more than one machine at a time provided that only one activity is accessed: however, such use is subject to copyright laws and any license or purchase agreement.

PRELAB STUDIES PART 1

DESCRIPTION

Title: Prelab Studies Part 1: General Chemistry
Series: Prelab Studies for General, Organic and Biological Chemistry
Authors: Sandra L. Olmsted & Richard D. Olmsted
Publisher: John Wiley & Sons
Source: 22 Worcester Road, Rexdale, On M9W 1L1
Subject: Science
Topics: See Pedagogical Content Description
Components: 4 disks, guide (30p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, color monitor preferred
Other Formats Available (not evaluated): Available in Apple format only
Alberta Education Call No.: QD 31.2 H758 051 1983

Version: 1983
Display Language: English
Cost: $217.56 (1985)
Tel. #: (416) 675-3580
Users : High School +

OBJECTIVES

Learners will be able to: identify personal and chemical safety procedures; utilize proper techniques with top-loading balances and graduated glassware; explain the Laws of Conversation of Mass and Definite Proportions using a balanced chemical equation; balance chemical equations and identify excess amounts of a reactant; verify a chemical change by calculating mole amounts from experimental results; explain and predict water's ability to dissolve ionic and polar substances; define colloids and explain some properties; define osmosis, dialysis, back pressure and applications to the living systems; define acids and bases using the Bronsted Theory and to explain the strengths of each; define and calculate pH's of acids and bases; and define, explain and predict hydrolysis.

PEDAGOGICAL CONTENT DESCRIPTION

This package consists of four disks:

DISK ONE: LABORATORY TECHNIQUES AND OPERATIONS

A. "Safety Review Exercise": Thirty questions about general lab safety (wearing apparel, proper conduct, disposal of materials, eye protection, etc.) are posed with an emphasis on "What should I do now" situations.

B. "Laboratory Techniques and Operations": Using a simulation format, this program presents proper techniques for use of the Mettler balances, graduated cylinders, burets and pipets.

DISK TWO: WEIGHT, MOLES AND STOICHIOMETRY

A. "Mole and Weight Relationships: Stoichiometry": This review explains the Law of Conservation of Mass and the Law of Definite Proportions with respect to balanced equations.

B. "Relationships Between Moles of Reactants and Moles of Products": A 5 question drill on balancing equations using a given number of moles, mass or volume of one substance is followed by three additional questions involving balancing equations and determining the identity and amount of the excess reactant.

C. "Weight Relationships in Chemical Changes: A Simulated Experiment": In this interactive exercise students analyze the reaction of lead metal in a copper ion solution.

DISK THREE: WATER, SOLUTIONS AND COLLOIDS

A. "Water as a Reactant": Text and animation are used to define dipole, polarity and hydration. Three simulations show the dissolution of sodium chloride, ammonia and methanol in water.

B. "Colloids and Colloidal Behavior": This program describes what a colloid is, explains why colloids do not precipitate and outlines what changes will initiate coagulation. Silver chloride and milk protein are used as examples.

C. "Osmosis and Dialysis": This program defines membrane types, osmosis and dialysis and simulates osmotic pressure and dialysis as it occurs in the exchange of nutrients and wastes in circulatory system.

DISK FOUR: ACIDS AND BASES

A. "The Bronsted Theory Revisited": Using definitions and animation, acids, bases, strong versus weak, and conjugate acid/base pairs are explained in terms of proton donation or acceptance.

B. "A pH Review": This program includes a definition of pH, provides examples of how to calculate pH from the hydroxide ion concentration, and includes drill questions on pH concentrations.

C. "Hyrolysis of Salts": Several examples of hydrolysis of salts illustrate how to recognize when an ion should interact with water and how to predict the result. Animations, experimental results and questions emphasize the properties of ions and their resulting solutions.

D. "Buffers": After reviewing the differences between strong and weak acids and bases, this program defines a buffer and graphically illustrates its operation using the mono- and dibasic hydrogen phosphate system. A 6 question true/false quiz summarizes the properties of a buffer.

E. "Mechanics of a Titration" - an overview of titration apparatus, use, safety and technique.

F. "Determination of a Molecular Weight: A Simulated Titration": The student reads a buret and then uses the average molecular weight to identify the unknown acid from a list of eight monoprotic, organic acids.

PEDAGOGICAL CONTENT EVALUATION

Most of the material covered in these programs is at an appropriate depth with good sequence and range for high school chemistry students. They are designed as an adjunct to regular labratory and classroom work and are generally not designed as stand alone units. Programs can be accessed in any order from the menu, thus allowing good flexibility. Topics are well illustrated with graphics and explanations, but are limited both in the number of examples provided as well as in the amount of drill questions. Minor inaccuracies in content can be found, for example the use of "weight" instead of "mass", use of "ml" instead of "mL", etc.

INSTRUCTIONAL FORMAT DESCRIPTION

After program selection from the main menu, student interaction consists of page turning (space bar), answer inputs, use of the left arrow key for correction, and the option to use the "ESC" key to return to the menu. All questions are objective in nature (i.e. yes/no, multiple choice, instrument readings, etc.) and occasionally are randomized from a limited test bank. Feedback consisting of an audio tone and a short message (ranging from simple presentation of the correct answer to a detailed explanation) is given after each question. Sequence and amount are generally program controlled; rate is user controlled.

INSTRUCTIONAL FORMAT EVALUATION

Student interaction, feedback, explanations, instructional techniques and question types are generally effective in providing review of the topics after classroom instruction has been given. Simulations are excellent and use graphics effectively to promote understanding of the topic under consideration. Interaction is consistent, but the amount of practice available is generally very limited. Sequencing within the programs may be too rigid due to lack of help branches as well as the necessity of always starting at the beginning. While immediate feedback is available after every response, all programs lack summative feedback.

TECHNICAL CHARACTERISTICS DESCRIPTION

Text is displayed in upper/lower case letters with single and double spacing used. The option of double width letters is available. Italics highlight key words and phrases and high resolution graphics are used in animations. Sound accompanies all student answer inputs: a musical tone is used for correct responses; a buzz for incorrect responses. Chemical symbols are correctly presented with sub- and superscripts. Minimal color is used.

TECHNICAL CHARACTERISTICS EVALUATION

The displays are excellent with clear screen layouts and effective use of scrolling to keep pertinent data in view. Graphics are of high quality and enhance the instruction. Input methods are generally consistent; however, occasionally it is unclear whether pressing the space bar will erase an incorrect answer or produce a new page. The programs are easy to use and appear to be completely bomb proof.

Sound unfortunately cannot be disabled. Limited color is used and use of a monochrome monitor would not affect instructional quality.

SUMMATION

The content of this package is generally appropriate and effective for use for high school students. Clear, concise explanations, effective content development, and excellent graphics combine to make the programs useful for review and remedial purposes. Weaknesses of this package include insufficient question randomization, inadequate practice, and lack of quantitative evaluation.

STATUS

"General Chemistry" has been designated as a **SUPPLEMENTARY** resource for Chemistry 10, 20 and 30.

PURCHASE INFORMATION

This product may be purchased for $217.56 (1985) from John Wiley and Sons at the address given at the beginning of the report. The product is guaranteed against defect for 90 days; subsequently, damaged disks can be replaced for $16.40

Due to frequent disk interaction, the disks in this package can not be used with more than one machine at a time.

PROBLEM SOLVING IN ALGEBRA

DESCRIPTION

Title: Problem Solving in Algebra
Author: EduSystem Inc.
Publisher: Encyclopaedia Britannica
Source: c/o Visual Education Centre, 75 Horner Ave., Unit One, Toronto, ON, M8Z 4X5
Subject: Mathematics
Topics: Problem solving in one, two or three variables
Components: 5 diskettes, manual (21p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monochrome monitor
Other Formats Available (not evaluated): TRS-80

Version: 1983
Display Language: English
Cost: $463.89 (1986)
Tel. #: (416) 252-5907
Users : Grades 8-12

OBJECTIVES

The learner will be able to read, translate and solve word problems that involve linear and quadratic equations in one, two or three variables.

PEDAGOGICAL CONTENT DESCRIPTION

This package consists of an introduction and thirty-eight programs on five disks:

DISK 1: Programs 1 - 7 present problems which ask the student to translate phrases into symbols (from numeric through two variable phrases) and write mathematical statements for word problems involving simple numbers, larger numbers, and one to three variables.

DISK 2: Programs 8 -14 present problems related to understanding word problems, graphing ordered pairs, constructing a table of values, translating word problems into systems of equations, and solving a system of equations by graphing or substituting.

DISK 3: Programs 15 - 21 review the solution of systems of linear equations in two variables by addition, translate word problems in geometry to systems of equations, solve systems of equations in three variables by substitution, review the comprehension of mathematical sentences, and solve systems with fractional coefficients.

DISK 4: Programs 22 - 30 address word problems involving fractions and money combinations, mixture problems given total weight or total value, motion problems with objects moving in parallel/opposite directions, and interest problems with combined rates.

DISK 5: Programs 31 - 38 include motion problems involving round trips, rate of work problems, rate problems for general events, mixture problems concerning the percentage of solute in the total solution, problems involving solving quadratics by factoring, and solving word problems which require the development of quadratic equations.

Generally the programs have a combination lesson/drill format. Prior classroom instruction is assumed; however, concepts are reviewed and student mastery is checked via a drill exercise. At the end of each program the student is given a score and a code which (s)he is expected to enter on a "Progress Chart" included in the documentation.

PEDAGOGICAL CONTENT EVALUATION

This package has an impressive range of content which should serve the needs of a large number of high school math students. The sequencing of the content is acceptable, although the progression from easy to more difficult problems with an unfortunate corresponding decrease in the amount of instruction given may cause problems for the less capable students. The range of content is appropriate except for the noticeable omission of a program dealing with the quadratic formula. The content is accurate but largely uses imperial units. Paper and pencil are required for many of the problems.

INSTRUCTIONAL FORMAT DESCRIPTION

Students select a program from the menu but henceforth sequence, rate and amount are all program controlled. Student interaction consists of initial menu selection, page turning, frequent answer input (numeric, variable and procedural) or multiple choice answers. Some problems have randomonly generated examples or questions drawn from a limited data bank; other programs use a fixed question bank. Feedback is provided after every question: correct responses receive a short, varied message; incorrect responses generally receive a "No, try again" message. The nature of the negative feedback depends upon the difficulty of the question. Simple questions receive the correct answer immediately following the first incorrect responses; more difficult questions may receive hints or step-by-step solution walk-throughs. Quantitative feedback, both cumulative and by question type, is given at the end of every program.

INSTRUCTIONAL FORMAT EVALUATION

In general the instructional technique is appropriate for the content, objectives and target audience, and includes an effective analysis of the skills required in the solution of word problems. There is frequent student interaction and questioning is satisfactory. The effect of a lack of randomization in the drill sections of some programs is minimized by the use of a large number of questions; however, in some cases this is itself a problem since the attention span of some students may be exceeded by the time required to complete the program. The student may leave a program at any time, but if (s)he returns to it (s)he must start at the beginning. This could be a significant program design weakness. More questions relating to the procedure of program solving would be useful.

Negative feedback is accurate and non-threatening, but could provide more explanation in many cases.

TECHNICAL CHARACTERISTICS DESCRIPTION

Text in a variety of fonts is presented in combination upper/lower case. Color and graphics are used for animation of text characters and to highlight important sections of the display. Sound is used to signal inappropriate responses.

TECHNICAL CHARACTERISTICS EVALUATION

Text displays are clear, well-organized, and use appropriate character size. Good use is made of graphics and selective scrolling to emphasize important sections of text. Programs are generally easy to use and, with the exception of programs 13 and 21, are essentially bomb proof.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

The managament system consists of a student progress code that is given to every student upon completion/exit from a program and is to be manually recorded by the student on his Student Progress Chart. The code provides the program number, the number of problems in the lesson, and other information regarding accuracy of performance. The teacher uses a Class Progress Chart for manually recording the progress codes of each student. These codes are not stored on the disk itself.

IMPLEMENTATIONAL SUPPORT EVALUATION

The value of this management system is determinined by the accuracy of the record keeping. If the student records the codes accurately, then the teacher would have a useful record of student progress. The management system could certainly be improved by having the codes stored on disk as files that could be accessed by the teacher.

SUMMATION

Although these programs do not provide enough instruction to be used as a stand alone instructional method, good sequencing and sound instructional design allow them to be effectively used for enrichment, remediation or review activities.

STATUS

"Problem Solving in Algebra" has been authorized as a SUPPLEMENTARY learning resource for grades 8 and 9 and for Math 10, 20, 13, 23, and 33.

PURCHASE INFORMATION

This product may be purchased for $463.89 (1986) from Visual Education Centre at the address given at the beginning of the report. Defective diskettes will be replaced without charge within a 30 day warranty period. Thereafter, diskettes may be replaced for approximately $40 upon their return to Visual Education Centre.

This product has the advantage of being capable of operation with more than one machine at a time provided that only one drill is accessed; however, such use is subject to copyright laws and any license or purchase agreement.

QUILL

DESCRIPTION

Title: Quill
Author(s): Bertram Bruce & Andee Rubin
Publisher: D. C. Heath Canada Limited
Source: 100 Adelaide Street West, Suite 1600, Toronto, Ontario M5H 1S9
Subjects: Language Arts
Topics: Writing Skills
Components: 1 disk with backup, 1 utility disk, teacher's guide (5pp.)
System Requirements: Apple II+/IIe/IIc, 64K, 80 column card, 2 disk drives, printer, monochrome monitor preferred
Other Formats Available (not evaluated): Available in Apple format only

Version: 1984
Display Language: English
Cost: $195.00 (1985)
Tel. #: (416) 362-6483
Users: Grades 3 - 12

OBJECTIVES

This program is designed to develop the "process of writing" emphasizing the required skills in three major stages: pre-writing, composing and revising.

This program consists of the PLANNER, the LIBRARY, the MAILBAG and the WRITER'S ASSISTANT.

DESCRIPTION OF "THE PLANNER"

The PLANNER is used in the pre-writing stage and is designed to enhance a student's creativity by having him/her brainstorm for ideas about a topic, put these ideas in outline form and then store the ideas in a planner file. A different planner file is used for each new piece of writing. The utility disk is used to create planner disks from blank disks. Planner files are created using the WRITER'S ASSISTANT program and can be modified and/or saved on the disk for future use. Each planner begins with an introductory paragraph followed by a series of guiding questions and statements which are responded to by inputting the responses.

To use the PLANNER, the student makes a choice by using: keywords, title and author, or entry number. The user may prepare notes and comments in response to the questions that have been prepared by the teacher, another student or by the user. The user is not able to edit his/her planner notes on the computer as the only editing that is possible is erasing characters just typed and retyping the correct letters. A printer is necessary to keep a copy of a student's notes since these cannot be stored on a disk.

EVALUATION OF "THE PLANNER"

The PLANNER is a useful and effective tool for generating and organizing ideas for a variety of compositions if sufficient thought and care is used to develop its use. This program helps to make students more conscious of the need to "plan" their writing and the students may also get more ideas for types of pre-writing questions by viewing other student planners. Most students in the target audience should be able to interact with this program with relative ease after an orientation; however, some grade three and four students may find the process too complex.

Although THE PLANNER has positive aspects, it would be enhanced if the computer's capabilities were fully utilized. For example, the student's responses and notes to a specific planner session cannot be edited or stored on the disk for later use and a printer must always be available in order to have a copy. This is a weakness since similar results could likely be achieved by handing out a printed copy of a planner with the questions and having the student respond on paper without using the computer.

DESCRIPTION OF "THE LIBRARY"

The LIBRARY provides a storage and retrieval system for students' and teachers' writing indexed by author, title and topic (identified by one or more keywords). (The WRITER'S ASSISTANT which is a word processor is used for creating and editing files.) The students input their own information, save it on a disk and then it is accessible to other students or teachers. A hard copy is also available.

EVALUATION OF "THE LIBRARY"

Using the LIBRARY is an effective way to encourage students to write, edit/revise and share their written work with their peers. This program can be effective for maintaining interest and enthusiasm in the writing process, but it is time consuming and the hardware requirement for dual disk drives may make it difficult to implement. To provide maximum effectiveness, this program must be used for a considerable length of time. It requires a commitment on the teacher's part to the "writing process" which includes pre-writing, composing, editing and publishing as well as a belief in peer editing and sharing among users.

DESCRIPTION OF "THE MAILBAG"

The MAILBAG allows for direct communication between individual students, groups of students, and teachers through an electronic message system. Messages are entered using the word processor and stored using the filing system. Once entered into the filing system, a file cannot be edited or removed by the students. A student gains access to a personal message only if (s)he enters the name under which the message is filed. If a message is addressed to a group, the correct Group name must be used in order to access the message. General messages are accessed by using the "Read" option for the bulletin board. THE MAILBAG can also be used to provide feedback on a student's composition.

EVALUATION OF "THE MAILBAG"

The MAILBAG is interesting and highly motivating for the students and it encourages students to communicate with each other in writing. It is very easy to operate and can be used for a variety of tasks. Although it is motivating, the direct learning benefits are questionable. It may be as effective for the students to share printed copies of their work with their peers for discussion as it is to use computer time AND Announcements for groups or classes can be posted via different media. Furthermore, sufficient hardware should be readily available in order to get maximum use of the program. It would be beneficial to allow for disposal of mail once it is "read" by the appropriate audience.

DESCRIPTION OF EDITOR FUNCTIONS OF "THE WRITER'S ASSISTANT"

The WRITER'S ASSISTANT allows a student to enter or revise text. Document length has a limit of 15,872 characters with the exception of THE PLANNER which is limited to approximately two and a half pages of text. Editor commands are prompted at the top of the screen and the first letter of each command is used to access that command. To alert the user to an error, the program sometimes uses sound, repeats the input request, or provides an error message. The HELP option explains each command in both the Novice and Expert setting. Cursor movements are controlled by four arrow keys, O and L keys, CONTROL I and the JUMP command which moves the user to the beginning or end of text or to a particular marker within the text. Deleted text which is removed by erasing individual letters, words, or complete lines with the DROP command can be retrieved. The ZAP command allows the user to erase vast amounts of text quickly but it is not retrievable. The MIX command enables the user to change a set of sentences into a paragraph and vice versa. Sentences within a paragraph can be displayed separately with each sentence beginning at the left margin. Scrolling includes line and page scrolling as well as quick jumps to the beginning, the end of the document, or to a marker that is predefined. Letters, words, lines and paragraphs can be moved from one place to another. Although the documentation does not indicate how much text can be moved, one analyst successfully moved three pages of text with the COPY command. The program will find particular letters, words or phrases and will replace each occurrence or a certain number of occurrences with something else. Each change can be previewed before it is finalized.

EVALUATION OF EDITOR FUNCTIONS OF "THE WRITER'S ASSISTANT"

The use of the editing commands at the top of each screen and the use of mnemonic commands such as "D" for DROP, "C" for COPY, etc. are effective and useful to the user. However, creating a document is not an easy procedure and students will require considerable practice to become proficient in the use of this word processor. The Write Mode which allows the user to enter and edit text is controlled by the IN and DROP commands. Since the one command allows text to be inputted and the other command must be used to make deletions, the student must constantly be moving back and forth from one command mode to another. It would be more effective and efficient to allow text to be edited as it is written. Occasionally the cursor disappears (and is returned by use of the View command) and the command line also disappears (use of any command will return it). These two occurrences are annoying and lead to confusion. When text is inserted into existing text, a space gap opens behind the cursor instead of the text being adjusted immediately into the format of the paragraph.

Generally the system detects an error and the user can usually make an easy recovery; however, the student must be familiar with the vocabulary used in the error messages. If a Pascal system error occurs, the only apparent recovery is to reboot the program or press the space bar which reboots the program. Although this occurs rarely, it is a drawback because the student's work is lost. Command structures are fairly easy to learn but some of the sequences are more difficult and require a number of steps and a number of commands to accomplish a task. The HELP feature and the availability of both the novice and expert levels are strengths.

The scrolling process is generally efficient except that the need to change the direction of the > or < symbols on the command line may cause difficulty for some students. The Copy command is complex and difficult for the novice user. Although it can be used to move any kind or amount of text, problems may result in that sometimes it leaves large gaps in lines, splits lines in two, or pushes text into the right margin. The TRANSFER command is simple to use but it lacks versatility. The search and replace functions are efficient and easy to use. The MIX command is one of the more unique and useful commands. When sentences are lined up separately, it is much easier for the student to check on capitalization, sentence variety, style, etc.

DESCRIPTION OF FILE MANAGEMENT FUNCTIONS OF "THE WRITER'S ASSISTANT"

If the user wishes to save his/her work, it is done automatically when the QUIT option is selected. The document must be given a title (in the PLANNER and the LIBRARY) or subject (in the MAILBAG) and the author(s) named. The user is asked to provide a keyword(s) that can be used to search out that document in the Planner and Library. This provides a simplified data base by which documents are stored for future retrieval. Various options are available including replacing old with new, creating new files with changes, etc. An entire disk may be copied by using the utility disk and specific files can be transferred to another disk of the same type. Documents can only be deleted by using the utility disk and the process is double checked by the user being asked if the file is to be deleted. No security is provided for the files; however, in the MAILBAG the correct name must be inputted in order that the student can read his/her mail.

EVALUATION OF FILE MANAGEMENT FUNCTIONS OF "THE WRITER'S ASSISTANT"

The filing system makes the students' writing available to other students for the purpose of peer editing and sharing of ideas. The process of saving is easy but it is time consuming. This is done automatically through the QUIT option, but no reminder to save documents is given. Making copies of entire disks proves somewhat difficult as even though assistance is given in the utility program, a number of codes must be entered which complicate the procedure. Since insufficient assistance is provided to clarify this procedure, it is fortunate that this process will not need to be used often. It would be useful to have an indication that the copying process is completed rather than having to list the files to check. Deletion of portions of documents or entire files is relatively easy but the process can be time consuming if many files are to be deleted. Although no security is provided, this is appropriate for this type of program.

DESCRIPTION OF PRINT FORMATTER FUNCTIONS OF "THE WRITER'S ASSISTANT"

Left, right and paragraph margins can all be established using the SET command. The settings can be 0 to 79 and can be changed at any point during the document creation. New margins take effect on the text typed after the parameter change. Although tabulations are not described in the documentation, it is possible to get eight spaces by pressing the Tab key. The user is unable to set tabs, but similar results can be obtained by using the Auto Indent feature. Paragraph indentation can be controlled; however the normal setting for paragraph margin is five spaces and it automatically indents after the RETURN key has been pressed twice. Line spacing stays locked at single spacing throughout the program. The screen display is the standard eighty column display with upper and lower case letters. Centering is available if the ALINE command is used. Boldfacing and other special features are available depending on the type of printer used. The program does not offer justification or double or triple spacing.

EVALUATION OF PRINT FORMATTER FUNCTIONS OF "THE WRITER'S ASSISTANT"

Margins are easy to set but the system is inadequate for formatting. It is unfortunate that no provision is made for double or triple spacing as the lack of space between lines makes the composition more difficult to read for the younger target audience. The finished copy appears crowded and editing/revising of a print copy is cumbersome with insufficient space for revisions.

When new text is inserted, some text disappears temporarily if the buffer is full. Although CTRL C brings it back, it would be more effective to have the format adjusted automatically. Print options are somewhat limiting in that when a document is being printed, there doesn't appear to be a way of stopping or pausing the printing process and there is no provision for printing a portion of the document.

DESCRIPTION OF IMPLEMENTATIONAL SUPPORT

A twenty-step plan for introducing "Quill" to the user is included in the COOKBOOK portion of the documentation. It introduces the students to computer vocabulary and use of the computer for developing writing skills. This is followed by the introduction and use of the MAILBAG, the LIBRARY, the PLANNER and the WRITER'S ASSISTANT. Each step is organized by objective, preparation and procedure. The documentation indicates that it will take four to six weeks to finish this orientation, depending on the amount of computer time, the number of computers available and the students' expertise. In addition to the COOKBOOK, the documentation provides an introduction, a description of the "Quill" programs and how to use them. It also provides sample classroom activities, lesson plans and suggestions for classroom computer management. The user support materials consist of a laminated card which provides a summary of basic commands.

EVALUATION OF IMPLEMENTATIONAL SUPPORT

Although the implementation of the "Quill" program is a time consuming process for the teacher, its comprehensive nature compensates for the time. It is essential that the teacher be committed to the "writing process". The program is not learned quickly by the students and the lengthy orientation is a must. Most grade three and four students would likely find the expert level too complex but may be able to handle the novice level with some assistance. Perhaps the inclusion of a tutorial for the students to reinforce the teacher orientation may be beneficial. The system's requirement of two disk drives and a printer may limit the use of this program in a number of situations. The documentation is comprehensive and does a thorough job of reviewing the philosophy of the program and various classroom activities that would support the program's implementation. The technical description of the WRITER'S ASSISTANT is somewhat sketchy and the user should not have to contact InterLearn Inc. for information about commands; this should be provided in the documentation. The summary command card is helpful.

SUMMATION

The major strength of "Quill" is that it supports the writing process and provides enthusiasm for writing. It makes students think about their writing before creation and it assists the students through the steps in the process to encourage them to improve their pre-writing, writing and revising skills. It also encourages peer sharing of writing. The comprehensive documentation is generally well organized, and provides useful information. The Cookbook is very useful to the teacher for orienting the students to the intents and uses of the program.

The major weaknesses are the time and the hardware that are required to implement this program as well as some deficiencies in the word processor. Considerable teacher time is required to establish the program and a significant amount of student time will be required on a regular basis. The hardware requirement for dual disk drives may make implementation difficult. The WRITER'S ASSISTANT has some weakness in text editing and formatting. The use of the electronic medium for parts of the program is questionable. This program would be enhanced with the inclusion of an editing and storing capability in the notemaking portion of the PLANNER. Loading some parts of the program is somewhat slow.

STATUS

"Quill" has been authorized as a **SUPPLEMENTARY** learning resource for Grades 5 - 12

PURCHASE INFORMATION

This product may be purchased for $195 (1985) from D.C. Heath at the address given at the beginning of the report. A package of four backup master diskettes may also be purchased for $195.

Defective diskettes will be replaced free of charge within a warranty period of 30 days. Thereafter, damaged diskettes may be replaced for $10 for up to two years after the date of purchase.

Due to disk interaction, this program can be used with only one machine at a time.

RATIOS AND PROPORTIONS

DESCRIPTION

Title: Ratios and Proportions
Author: Contemporary Perspectives, Inc
Publisher: Media Materials (formerly Milton Bradley)
Source: 2936 Remington Ave., Baltimore, MD 21211
Subject: Mathematics
Topics: Ratio and proportion
Components: 1 disk, teacher's guide (35p.), 26 reproducible worksheets
System Requirements: Apple II+/IIe only, 48K, 1 disk drive, color monitor preferred
Other Formats Available (not evaluated): Available only in Apple Format
Alberta Education Call No.: QA 117 R236 1983

Version: 1983
Display Language: English
Cost: $49.95 U.S. (1985)
Tel. #: (301) 235-1700
Users : Grades 6 - 9

OBJECTIVES

Students will be able to write fractions (ratios) in lowest terms, solve simple equations by division, write ratios and proportions in context, and write and solve proportions given word problems.

PEDAGOGICAL CONTENT DESCRIPTION

This package begins with two readiness speed drills (rewriting fractions in lowest terms and solving equations by division) which are pre-requisites to the following five skill areas:

1. Writing Ratios in Context: Users assess the test grades of two classrooms of students by writing comparison ratios in lowest terms.
2. Writing Proportions in Context: Using information gleaned from a table of hits during six months of the professional baseball season, students are asked to conclude whether the ratios used form a proportion.
3. Solving Stated Proportions: The student is given a proportion with one missing value for which a solution has to be found.
4. Solving Proportions in Context: Using information from a table of data involving sales at a grocery store, students are asked to solve a word problem using proportions.
5. Writing and Solving Proportions in Context: Given a table of data, the student must write a proportion (which must include a variable) and then solve the problem.

Each program is available in three learning modes: mastery (test mode), practice, and instruction. The mastery mode is a timed drill in which feedback is limited to presenting a correct answer if an incorrect response is made; the practice mode has a help avenue available which illustrates the solution to a similar type of problem; the instruction mode provides step-by-step direction in how to solve a given problem. Through use of the Student Record Manager, teachers can control student progress through the skill areas.

PEDAGOGICAL CONTENT EVALUATION

The range of content is generally appropriate for the average/above average student in the target audience. Material is presented in a clear, well-sequenced manner and the teacher option of assigning learning modes results in sufficient depth to accommodate individual differences.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of menu and mode selection, numerical answer entry or use of the "E" or "I" keys to access help routes. Questions are randomly generated from a limited data bank and are sequenced from easy to difficult. Feedback is given after each student response: a correct answer results in a positive comment randomly chosen from a group of six; an incorrect answer receives a comment such as "Try again" and/or a line drawn through the error. In the practice sections, help in the form of clues for arriving at a solution is automatically provided after two unsuccessful attempts at solving a problem. Quantitative feedback is given at the end of each drill. Except for the "Readiness Skill Section" in which rate and amount are program controlled, the user generally has control over rate. Sequence can be teacher controlled via alterations to the Student Record Manager.

INSTRUCTIONAL FORMAT EVALUATION

Instructional technique is generally appropriate and effective with sufficient student interaction to meet the objectives of the program. Pre-tests are directly related to computer program content. The provision of three learning modes in each skill area adequately accommodates individual differences. Questions are appropriate to the target audience; however, lack of sufficient randomization may result in the same question being posed within a given set. Feedback is immediate; however, it often does not distinguish between a wrong answer and incomplete or wrong format. Occasionally positive comments are inappropriately given when a student has performed poorly. Help avenues, while otherwise well-designed, make no allowance for different types of errors, hence a student who makes two errors on the same question is taken through identical steps of remediation.

TECHNICAL CHARACTERISTICS DESCRIPTION

Sound in the form of a ticking clock is used to indicate time lapse in the readiness skill section. Important reminders are highlighted by flashing. Text is presented in combination upper/lower case with high resolution text formation for problem sets. Minimal graphics and color are used.

TECHNICAL CHARACTERISTICS EVALUATION

Displays are appropriate for the target audience and transition from one display to another is usually smooth. In the readiness section the last display overwrites the previous one, resulting in an indecipherable screen. Pace of presentation is slow and may prove frustrating to above average users. Color adds interest but is not mandatory to program operation.

Note that the preview copy which we were given did not work on an Apple IIc; however, that copy was a 1983 version and subsequent versions of the product may work on a IIc.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

The Student Record Manager with a maximum capacity of 125 names provides the options of adding/deleting students, viewing/changing students on file, changing levels, running lessons. After evaluating the results of pre-test scores, teachers can assign one of three entry levels to each student. The management system can be circumvented and exercises chosen from a menu if this is desirable.

Reproducible student materials consisting of three sets of tests, twenty instruction and practice worksheets, student record sheets, and a class record sheet are provided.

IMPLEMENTATIONAL SUPPORT EVALUATION

The functioning of the management system is clearly outlined in the guide and steps must be adhered to closely to ensure proper operation. Unfortunately the management system does not fully utilize the computer's capacity--all records have to be manually maintained on student record sheets; the updates are then entered into the computer.

User materials, which could be used independently or in conjunction with the disk, are effective in providing reinforcement and practice of the skills presented in the computer program. Worksheet problems utilize both imperial and metric measurements.

SUMMATION

The major strengths of this program are the sequential development of ratio and proportion concepts, the high quality of user support materials, the availability of three different learning modes (including help routines), and the effective student interaction. Weaknesses include a poorly designed management system, lack of control over the amount of questions done in any program, and rather slow program movement.

STATUS

"Ratios and Proportions" has been designated as a **SUPPLEMENTARY** learning resource for grades 6 to 9.

PURCHASE INFORMATION

This product may be purchased for $49.95 U.S. (1985) from Media Materials at the address given at the beginning of the report. Defective diskettes will be replaced at no charge for as long as the product is available. Backup diskettes are available for $20.00 U.S. (1985)

Due to frequent disk interaction, this product may be used with only one computer at a time.

RAY TRACER

DESCRIPTION

Title: Ray Tracer
Author: David Vernier
Publisher: Vernier Software
Source: 2920 SW 89 Street, Portland, OR 97225
Subject: Science
Topics: Reflection and refraction of lenses and mirrors
Components: 1 disk, student's guide (5p.), teacher's guide (24p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, color monitor preferred
Other Formats Available (not evaluated): Available in Apple format only.
Alberta Education Call No.: QA 482 R263 1982

Version: 1982
Display Language: English
Cost: $24.95 U.S. (1985)
Tel. #: (503) 297-5317
Users : Grades 10 - 12

OBJECTIVES

Students will be able to:

1. Apply the laws of refraction and reflection to straight and curved surfaces.
2. Predict the path of light rays through materials of different refractive indices.
3. Gain a better understanding of the laws of geometrical optics.

PEDAGOGICAL CONTENT DESCRIPTION

"Ray Tracer" is a series of programs which deal with reflection and refraction to investigate dispersion effects. Fourteen modes are available via the main menu:

1. Straight Interface (Air -- Glass)
2. Straight Interface (Glass -- Air)
3. Straight Interfaces (Air -- Glass -- Air)
4. Straight Interfaces (Any Media)
5. Thin Lens
6. Thick Lens
7. Thin Lens in Medium
8. Two Thin Lens
9. Compound Lens
10. Spherical Raindrop
11. Plane Mirror
12. Spherical Mirror
13. Single Refracting Surface
14. Manual.

The content is designed to expose students by means of a demonstration and/or game situation to the investigation of ray tracing as applied to reflection, refraction, and the dispersion effect. Of the fourteen modes, nine have preset conditions of media and interfaces and six are designed as demonstrations where the user must select the conditions required. No examples or explanations are included in the program. The user selects from the main menu the particular conditions (s)he wishes to view. In each case a starting point and target are given and the user must enter the angle at which the light ray is to be drawn. Each program draws individual rays from left to right, and mirrors and lenses can have various spherical surfaces from -400 to +400 curvature.

The accompanying Student's Guide provides brief program descriptions and outlines commands used in running the program. The Teacher's Guide provides greater detail on each program, includes demonstration suggestions, and outlines the computer program and expected output.

PEDAGOGICAL CONTENT EVALUATION

Content range is appropriate for the target audience, and depth can be user controlled. The program offers good sequencing with the beginning programs dealing with wave intersection of plane surfaces (air, glass, diamond, etc.) and progressing through simple lenses (thin and thick) to compound lenses and raindrop dispersion. It should be noted that no explanation is given during the program, even to the point of explaining why a certain ray reflects, refracts or disperses. While the program does not teach concepts, it can serve as a good demonstration tool to illustrate by visual example and application most facets of refraction, reflection, lenses and mirrors. A lack of computer instructions and examples makes reliance on teacher explanation and/or the accompanying documentation mandatory.

INSTRUCTIONAL FORMAT DESCRIPTION

This program may be used by a student as a trial and error game or by a teacher as a special mode demonstration. Interaction is consistent and generally involves mode selection, angle entry, and/or pressing of the RETURN key. Feedback consists of a "beep" if the target is hit or a written message if the input is incorrect (e.g. "Ray would miss interface. Try again.") The program is basically user controlled, with an option to exit available at all times.

INSTRUCTIONAL FORMAT EVALUATION

Most effective use of this program occurs when it is used in demonstration mode by the teacher to illustrate a wide variety of situations relating to reflection and refraction. The program suffers from limited or total lack of instruction as to the nature of expected input, thus the student game mode is often reduced to nothing more than haphazard guessing in the hope of hitting a target.

The ease of interaction would be enhanced if instructions for clearing the screen, exiting, etc. were available on screen. Also, the screen printing scrolls too quickly to be read when three media are used. Student control of the pace of these portions of the program would be advantageous.

TECHNICAL CHARACTERISTICS DESCRIPTION

This program utilizes upper case standard text combined with high resolution graphics for ray depictions. For the two-ray option, red and blue colors are used for differentiation. Positive responses are rewarded with audio.

TECHNICAL CHARACTERISTICS EVALUATION

Displays are generally appropriate with large graphics suitable for demonstration. Occasionally some letter/number confusion exists (e.g. "S" and "5"). The ability to clear the screen without erasure of the topic under examination and the ability to move the source are useful features. Scrolling after the menu selection tends to clutter the screen. In some situations a timed scrolling of calculated angles is inappropriate.

Negative angles, when entered, are drawn correctly but they are not labelled as negatives.

Provided the documentation has been carefully read, the program is generally easy to use and is reliable. Only a small loss of effectiveness would occur if a color monitor was not used as only one option utilizes color distinction.

SUMMATION

As a classroom demonstration tool, this program represents an appropriate and interesting use of a computer to effectively simulate a variety of situations involving reflection and refraction. Use by individual students in game format is restricted primarily due to the lack of clear instructions on the disk.

STATUS

"Ray Tracer" has been designated as a **SUPPLEMENTARY** learning resource for Physics 10, 20 and 30.

PURCHASE INFORMATION

This product may be purchased for $24.95 U.S. (1985) from Vernier Software at the address given at the beginning of the report. The program is not copy protected and each school that purchases a program may make as many copies as desired for use in that school. If multiple copies are purchased at one time, Vernier Software is willing to sell them at a 40% discount. Should replacement be necessary by Vernier Software there would be a charge of $3.00 per disk.

READER RABBIT

DESCRIPTION

Title: Reader Rabbit and the Fabulous Word Factory
Author(s): Leslie Grimm
Publisher: The Learning Company
Source: 545 Middlefield Road, Menlo Park, CA 94025
Subject: Language Arts
Topics: Identifying letters, sorting letters into words, sequencing words according to a rule
Components: 1 disk, teacher's guide (36p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, colour monitor preferred, joystick or touch tablet (optional)
Other Formats Available (not evaluated): IBM PC/PCjr, Commodore 64

Version: 1984
Display Language: English
Cost: $39.95 US (1985)
Tel. #: (415) 328-5410
Users: Grades 1-2

OBJECTIVES

This program is designed to assist students to learn to identify letters and locate beginning, middle and ending letters in consonant-vowel-consonant patterns; use logic to unscramble letters to make words; compare words that differ by one letter to a given word; and match pictures, words, and parts of words from memory.

PEDAGOGICAL CONTENT DESCRIPTION

This program consists of four games that are intended to help develop reading skills. The games are as follows:

1. SORTER - This game requires the user to match words to a target pattern shown at the top of the screen. The concepts and skills involve identifying unfamiliar letters, gaining speed in recognizing letters, locating beginning, middle, and ending letters in consonant-vowel-consonant words and recognizing spelling patterns.
2. LABELER - Students are required to unscramble letters to spell words that name pictures. Locating letters in their beginning, middle and ending locations in c-v-c words, developing spelling skills, associating words with pictures and noticing middle vowel locations in c-v-c words are the concepts and skills presented.
3. WORD TRAIN - Students load a train with words that differ by one letter from the preceding word. The students are to use logic to sequence words by holding two variables (letters) constant while a third changes.
4. MATCH UP - This is a memory card game which matches pictures, words and parts of words. It is intended to improve spatial awareness (up/down, left/right) and to improve the ability to concentrate and remember.

The first three games increase in difficulty and should be used in order. Each game uses over two hundred three-letter words and builds on the skills from the game before it. The MATCH UP game can be played at any time. It has six different options with option A being the easiest.

PEDAGOGICAL CONTENT EVALUATION

The range, sequence and depth of content are appropriate and effective for the target audience. The content is accurate, unbiased and relevant; however, some students may have difficulty in identifying some of the pictures. Readability is very good and student interest level is maintained throughout the program.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of menu selection; using the spacebar to start a game, or to select a letter, word, or picture; using the I,J,K,M keys or arrow keys to move the hand pointer up, down, left and right; using ESC to return to the menu at any time; using ? for instructions for each game at any time; and + to change options in the SORTER, LABELER and MATCH UP games. The use of joystick or touch tablet is optional.

Questions are selected randomly from a limited data bank for the most part; however, the teacher or student has the choice of changing categories.

Feedback varies in each game. Generally, animated graphics and sound are provided at the end of a correct completion of a game. Audio feedback is provided after each response and consists of a high sounding beep for a correct response and a low sounding beep for an incorrect word chosen. If the student has errors in the SORTER game, positive reinforcement is withheld and the exercise is repeated with some variation. In WORD TRAIN, incorrect responses result in the train pulling out without cars attached, or with the number of cars attached matching the number of questions done correctly. No quantitative feedback or evaluation is provided in this program.

INSTRUCTIONAL FORMAT EVALUATION

Student interaction is generally appropriate for the target audience but most students will need some initial assistance with key manipulation. There is no set amount of activities to be done and a student may exit the program easily by using ESC. The first game allows three speeds but some students may find that the slowest mode is still too fast until they have had some practice. It is noted that "help" is primarily for the teacher since most students would not be able to read it. The questioning techniques are appropriate with effective randomization and a large enough data base to prevent boredom. It was noted that some of the word pictures are too abstract for the target audience. The feedback is immediate and generally effective; however, after numerous trials some students may find the positive reinforcements too lengthy and repetitive (these can be abbreviated). Sound is an option and generally it enhances the feedback. Although no quantitative feedback or evaluation is provided, the program does provide valuable reinforcement techniques.

TECHNICAL CHARACTERISTICS DESCRIPTION

Larger than normal text with both upper and lower case letters is used in this program. Highlighting is also used. Colour, sound, and graphics, including some animation, are utilized.

TECHNICAL CHARACTERISTICS EVALUATION

The displays are well designed and the enlarged text is used appropriately. Colour, sound and graphics are used effectively for motivation, cues and reinforcement. The animation enhances the program for the target audience. Although this program may be used on a monochrome monitor, it is more effective in colour. The students should be able to operate the program independently after the teacher explains how to play the games and after some practice in arrow key manipulation is provided.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

Students should be able to name at least half of the letters in the alphabet before using this program. This program does not contain a management system. The teacher documentation includes instructions for use of the program, a description of the games, the instructional objectives, suggested age level, additional activities, a word list, a picture word list and a koalapad touch tablet overlay. The additional activities suggested in the documentation may be used in the classroom after the students are familiar with games in the program.

IMPLEMENTATIONAL SUPPORT EVALUATION

The entry competencies described in the documentation are appropriate for the target audience. Some familiarity with the use of arrow key manipulation would reduce orientation time required with the students.

Although there is no management system included, it would be helpful to the teacher to have some evaluative mechanism in order to keep track of student performance.

The teacher documentation is well organized and easy to follow. The teacher should become familiar with each game prior to classroom use. The additional activities can be helpful as a follow-up in a classroom setting. After the students are shown how to play the games and the proper use of the required keys, little teacher supervision should be required; however, some students who have never used a computer will likely require a longer orientation period. Minimal computer competency will be required by the teacher to use this program.

SUMMATION

This program is an excellent motivator and can be used effectively in a regular classroom as a reinforcement tool in conjunction with teacher taught materials. The use of colour, sound and animation are very good and greatly enhance this program. This program provides sufficient practice and the variations to the traditional match up games are excellent. The documentation is comprehensive and easy to follow. The ability of the teacher to select picture words sets is a definite strength.

The inclusion of a management system and additional user materials would enhance the program.

STATUS

"Reader Rabbit" has been authorized as a **SUPPLEMENTARY** learning resource for grades 1 and 2.

PURCHASE INFORMATION

This product may be purchased for $39.95 U.S. (1986) from The Learning Company at 545 Middlefield Road, Suite 170, Menlo Park, California, 94025. In addition, they provide a "lab pack" of five disks for $60 U.S. (1986). Defective diskettes will be replaced without charge within a 90 day warranty period. Disks which are damaged by the user will be replaced for $10.00 U.S. upon return of the damaged diskette. This includes diskettes which wear out through normal wear and tear. There is no time limit for this warranty.

This diskette is capable of operation with more than one machine at a time provided that only one activity is accessed; however, such use is subject to copyright laws and any license or purchase agreement.

RESISTANCE

DESCRIPTION

Title: Resistance
Series: Basic Concepts of Electricity Series (#3)
Author: George S. MacRae
Publisher: Merlan Scientific Ltd.
Source: 247 Armstrong Avenue, Georgetown, Ontario L7G 4X6
Subject: Science
Topics: Ohm's law, electrical resistance, resistance in circuits
Components: 2 disks and backups, teacher's guide (17p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monochrome monitor
Other Formats Available (not evaluated): Commodore PET/64

Version: 1983
Display Language: English
Cost: $95.00 (1985)
Tel. #: (416) 877-0171
Users: Grade 12

OBJECTIVES

After completing the three programs contained on this disk, students:

1. Will be able to determine the relationship between the current that flows through a wire and the potential difference across its ends.
2. Given two of the current passing through a conductor, the potential difference across its ends, and its resistance, will be able to calculate the third.
3. Will be able to list four factors which determine the resistance of a wire.
4. Given a network of resistors connected in a series, parallel or combination, will be able to determine the effective resistance of the network.

PEDAGOGICAL CONTENT DESCRIPTION

This disk contains three program:

OHM'S LAW - is a simulated experiment which explores the relationship between current flow through a wire and the potential drop across its ends. It is organized in such as way that results can be written up as a formal lab report.

ELECTRICAL RESISTANCE - The lesson portion of this program teaches the use of Ohm's Law in the form of R=V/I, has the user complete some exercises, and then proceeds to an example where the formula must be rearranged.

COMBINATIONS OF RESISTORS - explains resistors in series and parallel combinations, provides example questions, and contains student exercises pertaining to each.

Both programs two and three also contain a drill section designed to strengthen a student's understanding of the concept(s) under consideration.

A separate test disk contains multiple choice questions based upon the three lessons. Scores, diagnostic information and an optional printout are provided.

PEDAGOGICAL CONTENT EVALUATION

The presentation and development of each concept is logical and well ordered. Animation is used effectively to illustrate textual descriptions and clarify abstract concepts. Range, content and depth are appropriate for the target audience. While the programs are intended to be sequential, they can be accessed in any order.

A content error was noted: the data output of a very small current (e.g. 0.005) is paired with a potential drop of zero. While this may be true in practice, it is theoretically incorrect.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of menu selection, page turning, answering yes/no questions, keying single letter answers, or entering short words/phrases to complete a sentence. Questions within each lesson are presented in a fixed order, however review questions to test student understanding are randomized from a limited test bank. Correct answers receive positive textual feedback such as "Great Work" and close answers (e.g. entering a synonym for a word) receive a cautionary message such as "Hold on now". Feedback to incorrect answers informs the student the answer is wrong and the program usually allows a second attempt before presenting the correct answer. If a number of questions are answered incorrectly the program may go over the material again. Quantitative feedback is provided continually throughout the drills and encourages the student to get a perfect score.

The test diskette gives the user a choice of quantitative feedback after each question or at the end of the test. The user is also given the opportunity of reviewing the questions and is provided with an explanation of the concept that pertains to the questions answered in error. If a printer is available, a hardcopy printout of the student's score and diagnosis of areas of weakness can be made.

Sequence and rate are user controlled; amount is program controlled.

INSTRUCTIONAL FORMAT EVALUATION

The method of moving from the concrete to the abstract via example is instructionally sound. The program allows ample student interaction and the error checking routines for close but incorrect responses is very good. Occasionally the randomized textual positive responses are inappropriate--for example "Super" is likely not the best adjective to be used if the student needed five incorrect tries before arriving at the correct answer. Although questions within the tests are effectively randomized, the fixed order of questions within the lesson presentation limits potential reuse of the disk. The quantitative feedback and analysis of error provided during the post-test should enable students to recognize their weak areas and do specific corrective study on these areas. Unfortunately student scores are not saved to disk.

TECHNICAL CHARACTERISTICS DESCRIPTION

High resolution animated graphics are coupled with combination upper/lower case lettering.

TECHNICAL CHARACTERISTICS EVALUATION

Overall technical design is very good, however the inability to exit a drill until all ten questions are completed may be considered a drawback. The option of obtaining hard copy results of the post-test along with an analysis of areas of weakness is very useful. Displays are well formatted and the use of animation effectively contributes to student understanding. The fact that each lesson loads totally into memory upon initial booting is a program plus.

An inconsistency was noted in the circuit diagrams in that standard circuit diagram symbols are used for the cell or power source but they are not used for circuit resistors.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

Teacher documentation in the form of a 22 page 3-ring binder provides operating instructions, outlines program objectives, and provides an overview of the disk contents.

IMPLEMENTATIONAL SUPPORT EVALUATION

The program is easy to implement in a classroom and students should be able to work independently with little or no teacher intervention.

Two errors were noted in the documenation:

1. Ohm's Law in formula form is staed as $V=I/R$ rather that $V=IR$.
2. User's are informed that two consecutive answers will cause the program to advance, however in some places five corrected answers are required.

SUMMATION

The graphics used in this progra greatly enhance student understanding of rather abstract concepts. Helpful feedback, printed quantitative analyss of student learning, and branching for review all contribute to the instructional strength of this package.

STATUS

"Resistance" has been designated as a SUPPLEMENTARY learning resource for Physics 30.

PURCHASE INFORMATION

This disk is part of a series and may be purchased for $95.00 (1985) from Merlan Scientific Ltd. at the address given at the beginning of the repot. The entire series may be purchased for $295.00 It consists of 4 modules: "Basic Concepts"; "Introduction to Crcuits"; "Resistance"; and "Electrical Energy". All of these have been authorized as Supplementary resources and reports on them are contained in this document.

Defective diskettes will be replied without charge within a one year warranty period. Disks which become inoperable through normal use may be reaced for $15.00.

This disk has the advantage of being capable of operation with more than one machine at a time for any particular lesson; however, such use is subject to copyright laws and any license or purchase agreement.

SIMULTANEOUS LINEAR EQUATIONS

DESCRIPTION

Title: Simultaneous Linear Equations
Author: Mark Berman, Kevin Vessio & Don Ross
Publisher: Microcomputer Workshops
Source: c/o CBS Interactive Learning, One Fawcett Place, Greenwich, CT 06836
Subject: Mathematics
Topics: Solving simultaneous linear equations
Components: 1 diskette, backup, guide (5p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monochrome monitor
IBM PC, 64K, monochrome monitor
Other Formats Available (not evaluated): TRS 80 Models III/IV, Commodore 64

Version: 1984
Display Language: English
Cost: $29.95 U.S. (1985)
Tel. #: (203) 622-2500
Users : Grades 9-11

OBJECTIVES

This disk is designed to:

1. Provide students with practice in solving simultaneous linear equations by addition and subtraction.
2. Show the relationship between an algebraic solution and a graphical solution of two linear equations.

PEDAGOGICAL CONTENT DESCRIPTION

Following an optional explanation, the student is given problems to solve with two simultaneous linear equations, generated in the form of Ax + By = C. All coefficients and solutions are integers between -5 and +5 inclusive. Any number of questions may be chosen between 1 and 9.

Each problem is displayed on the top of the screen, a working area is provided, and a menu is depicted from which students choose the order in which the problem is to be solved. The user then modifies the question if the correct option was chosen and proceeds to select another option until the correct answer is determined. The student must solve for both variables algebraically. Each equation solution is graphed at the end of the solution process.

PEDAGOGICAL CONTENT EVALUATION

The content range is sufficient for the intents of the program. The randomized presentation of questions provides ample depth. While there is no overall sequencing from easy to difficult, within each question students must choose from a menu the steps to be taken in the completion of a problem, thus ensuring that they follow a specific sequence of procedures for problem solving. As such, the program is best used for remediation; however, as there is no easy to hard sequence nor are difficulty levels available, the user will require previous instruction on solving sumultaneous equations before attempting this program. The explanation at the beginning is not designed for original instruction and only provides directions on how proceed through the various solutions steps in the program; explanations on concepts behind those procedures are not given. The student can complete this section merely by following instructions to enter specific keys - no thinking is required.

The program utilizes a consistent pattern of presentation and material is logically organized. Each step is clearly presented with cues and prompts on the lower part of the screen. A variety of mathematically correct methods for solving equations is allowed.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction involves menu selection, page turning via the RETURN key, entering the number of questions desired, and numerical answer inputs. Questions are randomly selected from a limited test bank. An incorrect answer results in several encouraging hints designed to help the student achieve the correct answer. A correct answer to each step in the solution promotes the student to the next part of the question, and after achieving a final correct solution, a congratulatory message is displayed. When all questions have been completed, the program lists the errors according to type (e.g. eliminating a variable, solving linear equations or computations, etc.)

INSTRUCTIONAL FORMAT EVALUATION

Instructional technique is appropriate in helping students improve their skill at solving linear equations. Student interaction is generally effective; however, instruction and answer verification sections limit student involvement to page turning and hence may not be very motivating. Feedback is appropriate as it provides a hint before giving the correct answer, thus encouraging students to think for themselves. The graphical solution further reinforces each correct solution. As a drill and practice program, the error analysis following each set of questions is quite useful; however, it is unfortunate that it is not included in a management system to provide teachers with a summary of student progress.

The presentation of the algorithm is sound. However, users are locked into the algorithm and have no opportunity to skip steps or move at a faster rate. This can make the program boring for students familiar with the process.

TECHNICAL CHARACTERISTICS DESCRIPTION

Sound and color are not used in this program. High resolution graphics are used to plot all simultaneous equations.

TECHNICAL CHARACTERISTICS EVALUATION

Displays are clear and well formatted. Pertinent information is effectively kept on the screen at all times and only the workspace area is scrolled. Within each program the user has effective control to enable comfortable reading and absorption of each display; however, the fact that a student cannot exit a program and later re-enter at the point at which (s)he left off is an undesirable feature.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

The thirteen page teacher's guide outlines the program's objectives and provides a description of the program contents.

IMPLEMENTATIONAL SUPPORT EVALUATION

The teacher's guide is clearly and succinctly written.

SUMMATION

Although this program does not offer instruction in depth, it does provide useful reinforcement and practice in the area of solving simultaneous linear equations. Students are effectively guided through a pattern for arriving at a correct answer and can see this solution in graphic form. However, the lack of sequence from easy to difficult and the structured progression through the algorithm limits the program somewhat. It would be most appropriate for remediation where the student has had some introduction to the concepts and needs the structured assistance this program can deliver.

APPLE - IBM VERSIONS

This report is based on the evaluation of the Apple product. In reviewing the IBM version, it was found that it did not differ in any substantial fashion from the Apple product.

STATUS

The Apple and IBM versions of "Simultaneous Linear Equations" have been authorized as SUPPLEMENTARY learning resources for Grades 9-11.

PURCHASE INFORMATION

This product may be purchased for $29.95 U.S. (1985) from CBS Interactive Learning at the address given at the beginning of the report. Lab packs are available in the following quantities and prices: 10 copies @ 3 x list price; 15 copies @ 4 x list price; 20 copies @ 5 x list price; 25 copies @ 6 x list price. The company provides a life time guarantee against defective diskettes and will replace worn out diskettes without charge at any time.

Due to frequent disk interaction, this product may not be used on more than one machine at a time.

SOUNDS ABOUND

DESCRIPTION

Title: Sounds Abound: An Accounting Simulation for Microcomputer & Manual Actg
Author: Clairmont Carter
Publisher: Houghton Mifflin Canada Ltd
Source: 150 Steelcase Road West, Markham, Ontario L3R 1B2
Subject: Business Education
Topics: Computerized accounting simulation
Components: 1 disk, teacher's guide (4pg.), student's workbook (91p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monitor
Other Formats Available (not evaluated): IBM PC, TRS-80 Models III/IV

Version: 1984
Display Language: English
Cost: $64.45 (1985)
Tel. #: (416) 475-1755
Users: High School

OBJECTIVES

This package is designed to:

1. Reinforce accounting procedures relevant to sole proprietorship operations.
2. Provide students with realistic business experience in keeping accounting records, both manually and by computer.
3. Give students experience in reading and analyzing typical source documents and determining what information to record from those documents.

PEDAGOGICAL CONTENT DESCRIPTION

"Sounds Abound" is a simulation that requires the user to keep the accounting records of a sole proprietorship for a one month period. Nineteen accounts are used in this simulation with provision for thirty transactions per month per account. Debits and credits are differentiated by entering a "D" or "C" after the numerical amount.

Students analyze source documents, make journal entries, post to a general ledger and complete end-of-fiscal period work (work sheet, income statement, balance sheet, etc.). The simulation centers on general ledger journals, ledgers and reports--it does not feature a detailed accounts/receiveable nor a payroll section. An optional banking unit provides practice in writing checks, preparing bank deposit slips, and reconciling a checkbook with a bank statement.

PEDAGOGICAL CONTENT EVALUATION

This simulation, designed to be used after an initial manual exploration of the accounting cycle, provides a good reinforcement of basic accounting concepts and offers students experience in keeping the records of a sole proprietorship for a one month period. A trial balance, balance sheet, or income statement can be generated at any time and the printouts are very realistic. The optional banking unit, the inclusion of source documents, and the intentional errors made to encourage students to check for accuracy add further realism to the simulation.

Unfortunately, the program does not deal with detailed accounts receivable/payable functions nor does it offer a module on payroll.

INSTRUCTIONAL FORMAT DESCRIPTION

Students complete the simulation with the aid of a workbook which is divided into two parts: A Procedures Manual explains how to complete the monthly transactions manually; an Operator's Manual describes how to use the microcomputer to complete the business simulation. Instructions and sample entries provided in the workbook guide the student through each phase of the accounting cycle. The entry of numerical data does not require commas, and the computer automatically inserts the decimal point and trailing zeros for whole numbers. The chart of accounts uses the five major divisions necessary for a service business (i.e. assets, liabilities, owner's equity, revenue, and expenses) and can be adapted to accept input for any business, not just the "Sounds Abound" company under consideration.

INSTRUCTIONAL FORMAT EVALUATION

This package offers an effective review of the accounting cycle of a sole proprietorship. Within the confines of 2 - 5 hours, students complete all the accounting records for a one month period. Materials are logically sequenced and instructions are clear. The fact that the computer automatically checks whether debits equal credits for each posting entry means that errors are caught immediately at source. The program offers effective help routines to assist users who may experience difficulty.

While users are given an initial opportunity to "okay" every entry to the chart of accounts, subsequent changes are not possible. If an error is detected after the entry has been okayed, the entire chart of accounts must be re-entered--this can prove time consuming.

The program does not allow for cash balance verifications as a check, however trial balances can be generated at any time. Closing and adjusting entries are not explained, but they are clearly identified by using the explanation for the entry data.

The package offers the option of being completed manually, by computer, or by combined methods. If students are instructed to do the simulation first manually and then by computer, they will have a clear understanding of the advantages of computerized accounting.

TECHNICAL CHARACTERISTICS DESCRIPTION

Using this simulation requires that students boot the program diskette and then use the storage diskette to record their monthly transactions. Students are required to enter their name upon initial booting, and entry of a new student name automatically removes all data entered by the previous student.

Since all reports are screen-generated, the program can be used without a printer; however, it proves advantageous for students to have individual printouts for comparison with the workbook, for comparison with each other, and for marking purposes.

TECHNICAL CHARACTERISTICS EVALUATION

Menus and sub-menus clearly outline program contents. The option of printing to screen enables documents to be checked for accuracy before obtaining hard copy printouts. The fact that the program authorizes the user to duplicate as many copies of the diskette as are needed for student use is a definite program plus. Provided students exit the program properly, records are automatically saved--another positive feature.

Teachers may be pleased to note that upon entering a new user name in the opening frame, all accounting records contained on that disk are automatically erased, thus making it almost impossible for one student to use the work of another student.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

The 43 page teacher's manual outlines learning goals, provides suggestions for using the simulation, outlines evaluation and follow up activities, includes nine pages of selected screen displays and twenty-four pages of solutions.

The 91 page student manual contains fourteen pages of instruction followed by problem exercises which guide a student through a monthly accounting cycle.

IMPLEMENTATIONAL SUPPORT EVALUATION

Both the teacher's guide and the student workbook are well organized, instructions are clear, and accounting forms closely approximate those used in business. The abundance of illustrations, pictures and examples clarify the data entry process. Students who have been exposed to the basic accounting cycle via classroom instruction should have no difficulty completing this simulation independently.

SUMMATION

Although not intended to provide initial instruction in the accounting cycle, this simulation does a credible job of providing a realistic overview of the accounting functions performed within one month of operation in a service business. The program is very user friendly, it accepts data relevant to other problems as well as those outlined in the manual, it generates very readable reports which are consistent with established accounting principles, and it offers close support for modules 1, 2, and 3 of the present Alberta Accounting Curriculum.

Unfortunately the simulation does not deal with detailed accounts receivable/payable functions nor does it offer a module on a payroll system.

STATUS

"Sounds Abound" has been authorized as a **RECOMMENDED** learning resource for high school students.

PURCHASE INFORMATION

Alberta schools may purchase this product from the School Book Branch for approximately $60. This includes the disk, student text workbook and teacher's manual. See the School Book Branch catalog for specific pricing and warranty information.

Due to frequent disk interaction, this product may be used on only one machine at a time.

SPECTRUM

DESCRIPTION

Title: Spectrum
Author: Stephen Shalom
Publisher: Sunburst Communications
Source: 39 Washington Avenue, Pleasantville, NY 10570
Subjects: Computer Literacy, Problem Solving
Topics: Discovering patterns, programming logic, building skills in writing programs
Components: 1 disk with backup, teacher s guide (34p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, color monitor optional
Other Formats Available (not evaluated): Available in Apple format only

Version: 1984
Display Language: English
Cost: $59.00 US (1985)
Tel. #: (914) 769-5030
Users: Grade 6 - 11

OBJECTIVES

As a result of using this program students will be able to:

1. Find order and discover patterns.
2. Practice following the logic of simple programs.
3. Build skills in writing simple computer programs.

PEDAGOGICAL CONTENT DESCRIPTION

This disk contains two programs:

PLAY A GAME - The user, playing at one of nine difficulty levels, attempts to determine a hidden pattern of bars of either colors or shapes with as few clues as possible. Once the user has discovered the pattern, (s)he attempts to match it either by listing the pattern bar by bar or by writing a pattern generating program.

CREATE A PATTERN - This program allows the user to write a hidden program or pattern either for practice or to challenge other players.

Each game can be played individually or in small groups.

PEDAGOGICAL CONTENT EVALUATION

The activities on this disk promote the development of logic and inductive reasoning. Instructions are generally easily understood, however teachers may need to assist younger students with the instructions for loop statements. The nine playing levels offer good range, and the incremental increases in difficulty levels provide students with a structured learning sequence as each stage lies within certain parameters (e.g.the number of repetitions, the degree of randomness, the locations of random features, and the number of colors or symbols used.) An unlimited number of patterns can be created.

Although there are nine levels, their parameters can extend across levels. Thus, although a student has selected level 3, it may occur that the puzzle (s)he is given is a level 1 problem. This can be advantageous as students are not able to predict - 'this is level 3, therefore the puzzle has to be of this type'. However, there are also a number of disadvantages. Trial runs at the lower three levels resulted in a heavy preponderance of level 1 problems only. Also, a student may feel it unfair when a competitor receives an obvious pattern and (s)he is given a much more complicated one to solve. (The scoring system, however, does counter this somewhat.) This situation could be solved if a round consisted of more than one puzzle to solve. Although, students can choose to play again, the start up procedure has to be repeated and this can be frustrating. Having the user determine the number of puzzles to be posed at the beginning of the game could alleviate both problems of range of difficulty and lack of depth of one sitting. Allowing students to play at varying levels of difficulty would also enhance the game (i.e. one student plays at level 3, another at level 6).

Since the "Instruction" program should be viewed first, it may be more appropriate to list it on the menu as program one rather than as program three.

The clarity of the loop statement (F1#9) would be improved if the instructions clarified that "F1" means from FROM PROGRAM LINE NUMBER 1 as opposed to FROM BAR NUMBER 1. This is not really clear until the student faces problems of trying to enter loops that start at bar #12 but at line #5 of the program.

The content would likely be best suited to a grade 6-10 audience.

INSTRUCTIONAL FORMAT DESCRIPTION

Via menu selections, students choose a program and then enter their name and desired difficulty level (this can also be teacher controlled). Thereafter, students input numbers, letter symbols for colors, RETURN, or one or four letters representing a computer instructional command. Notetaking is usually required and reproducible forms are provided. Patterns are randomly chosen and clues are provided when they are requested by the user. Incorrect entries are either not accepted or are acknowledged with a phrase such as "Error. Try again". Partially correct answers receive a message listing how many tries the student made, the number right and wrong, and any inconsistencies that should have been caught. A totally correct response provides a burst of beeps and the message "You Got It!" The user is then shown the program which was used to write the pattern.

The student has total control of rate, sequence and amount. In addition, the teacher can control the difficulty levels and can define the pattern generating program and thus limit student access.

INSTRUCTIONAL FORMAT EVALUATION

Student interaction is appropriate for the target audience. Entries can be corrected provided that the RETURN key has not be pressed. The manipulation of programs and patterns promotes the inquiry method of thinking and meets the package objectives of developing pattern recognition skills and logical thinking skills. Feedback is appropriate and the help provided via clues is indispensable. The fact that the program used to write the pattern is displayed after a student's successful attempt is a strength as it invites students to compare the conciseness of the computer-generated program with their own. Motivation and interest run high provided the student has chosen the correct degree of playing difficulty. (The fact that teachers can custom tailor the level of difficulty to the needs of the audience is a definite strength.)

Feedback for incorrect errors is somewhat limited. It would be preferable to have some explanation or hint available as to why a particular entry was wrong.

The score provided at the end of the program is effective in maintaining student interest; however, since most students would be unaware of the factors influencing it, a continuous running score reflecting the results of each student input may be more motivational.

TECHNICAL CHARACTERISTICS DESCRIPTION

The graphics used in this program can be run on a color monitor, or, if a monochrome monitor is used, color patterns will be replaced by a variety of shapes. Sound, consisting of a variety of buzzes and beeps, accompanies each input, however the teacher can elect to disable it. A variety of high resolution print sizes are used depending upon the available space. Provided access to the instructions are not required, the disk can be removed from the disk drive and program operation can be continued.

TECHNICAL CHARACTERISTICS EVALUATION

Print size is appropriate. Color is used effectively and can be adjusted at the beginning of the program for good balance. The fact that sound can be teacher disabled is an advantage as sound would likely prove distracting in a classroom setting. The fact that the program generator requires over a minute to produce a pattern at advanced difficulty levels can prove frustrating.

Entering a program listing can be somewhat difficult as the student can not see any previous lines. This is caused by the necessity to keep the bar display on the screen and there is only one line at the bottom of the screen to work with. However, as the entire bar does not have to be seen, a split screen technique could be used so that the entire pattern as well as the full program listing could be shown.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

The 28 page teacher's guide includes objectives, game details, program rules and allowable statements, scoring techniques, a description of teacher options and game strategies, and suggestions for classroom use. Student support materials include a student record sheet and a game plan worksheet.

IMPLEMENTATIONAL SUPPORT EVALUATION

The teacher's documentation is thorough and well laid out. The option of being able to restrict students to a certain program has the potential value of insuring that all students in a class work on the same problem; however, it is very time consuming for the teacher to then select another program, especially if this needs to be done at each terminal.

The student game plan sheet is effective in strategy planning.

SUMMATION

This package presents effective drill designed to develop pattern recognition, prediction, logic, inductive reasoning and program writing skills. Strengths include the sequence of difficulty, the teacher control of features, the motivation of the game format and the ability of students to enter their own patterns. Weaknesses include the lack of helpful feedback for students having difficulty, the necessity to go through start-up procedures to play again, the inability to see the entire program listing as it is created and the long delays when high difficulty patterns are created.

The overall quality of the package is good - students will generally find the programs motivational and learning will take place that impacts in both computer literacy ad problem solving areas.

STATUS

"Spectrum" has been authorized as a **SUPPLEMENTARY** learning resource for Computer Literacy 6-10, Problem Solving grades 6-10 and Math 15/25.

PURCHASE INFORMATION

This product may be purchased for $59.00 U.S. (1985) from Sunburst Communications at the address given at the beginning of the report. A lab pack, consisting of 10 diskettes and one set of teacher documentation is available for $177. U.S. (1985). Sunburst Communications offers a lifetime warranty on their courseware products and will replace defective diskettes at no charge.

This disk has the advantage of being capable of operation on more than one computer at a time; however, such use is subject to copyright laws and any license or purchase agreement.

STICKYBEAR MATH I

DESCRIPTION

Title: Stickybear Math I
Authors: Richard Hefter & Susan Dubicki
Publisher: Field Publications
Source: 245 Long Hill Road, Middletown, CT 06457
Subjects: Mathematics
Topics: Addition & subtraction
Components: 1 disk, parent's guide (16p.), 1 Stickybear poster, 1 sheet of Stickybear stickers
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monitor
Other Formats Available (not evaluated): Commodore 64

Version: 1984
Display Language: English
Cost: $39.95 US (1985)
Tel. #: (203) 638-2400
Users: Grades 1 - 4

OBJECTIVES

This program is designed to provide focussed drill and practice in basic addition and subtraction skills for children ages six through nine.

PEDAGOGICAL CONTENT DESCRIPTION

"Stickybear Math" provides drill and practice in basic addition and subtraction. Twenty levels of difficulty are available: the lowest levels begin with the use of animated objects and numbers less than five and can be viewed in either horizontal or vertical format; the advanced levels progress through missing addends and subtrahends to four-place addition involving multiple carrying and three-place subtraction involving multiple borrowing.

PEDAGOGICAL CONTENT EVALUATION

Content range, sequence and depth are all appropriate for the target audience. The Stickybear obstacle adventure helps to keep motivation high. The option of viewing questions in horizontal or vertical format is a nice feature; however, since the borrowing and carrying of numbers are not shown, the higher level questions may be too difficult for the target audience.

INSTRUCTIONAL FORMAT DESCRIPTION

First-time users can be entered at any level by activating the CONT-C option while the welcome page is on the screen. If RETURN is pressed instead, users begin at level one. CONT-Z ends a student's session and records his/her progress. The student then continues from that point in subsequent lessons.

Addition and subtraction questions are randomly presented in three different forms: vertical, horizontal and missing parts (6 + ___ = 9). Multiple addends are also available. The format and difficulty of questions may be preset if desired. Users interact by entering numeric answers and pressing RETURN. Although the program does not provide corrective feedback, the teacher may set the program to allow 1 - 4 tries before the correct answer is shown. The level of difficulty adjusts upward or downward depending upon the degree of success the student is experiencing.

Positive feedback includes a pleasant sound and, at the lower levels, animated objects that move to reinforce the answer. Stickybear's progress toward overcoming an obstacle is reviewed periodically throughout the drill and is completed graphically after about 25 questions have been correctly answered. Quantitative feedback provides the entry and end levels, the total number of questions attempted, the total correct, and the percentage correct.

INSTRUCTIONAL FORMAT EVALUATION

Questions are well randomized and the parent/teacher has good control options. The animated feedback which reinforces correct answers at the lower levels is good--it is unfortunate it is not incorporated at the higher levels. Indeed, students who elect to disable sound are denied positive feedback at these upper levels. The lack of corrective feedback is a program weakness, however the fact that the level of question difficulty automatically adjusted based upon the user's success rate helps to decrease frustration. Nevertheless, teacher should be aware that no feedback assistance is given for errors other then showing the correct answer.

Some evaluators felt that the number of questions/unit of adventure may have been too high for the target audience.

Interaction procedures are also somewhat weak. No carrying or borrowing numbers may be entered and this may create some problems for weaker students at the upper levels. In the lower levels, interaction on horizontal questions is initially from left to right (i.e. for well-known math facts), however other horizontal questions have cursor control from right to left. It would be easier on the user if the method of interaction was consistent by format rather than by difficulty of the question.

TECHNICAL CHARACTERISTICS DESCRIPTION

This program utilizes colored, high-resolution animated graphics. Large numbers and upper case lettering are used. Sound can be disabled.

TECHNICAL CHARACTERISTICS EVALUATION

The program is user-friendly and the animated graphics add to program interest. While the idea of helping Stickybear overcome an obstacle provides excellent motivation, the final graphic illustration of this process is time consuming.

Sound can be disabled, however should students elect to disable sound, they lack positive feedback in the upper levels where animation is not included (i.e. a correct answer will move the student on to the next question).

IMPLEMENTATIONAL SUPPORT DESCRIPTION

The 16 page user's guide describes the objectives of the program and includes a description of the management system.

The management system allows the teacher to select eight options: number of tries, level of difficulty, addition questions, subtraction questions, missing addends, column addition/subtraction, and multiple addends. It also allows the teacher to see a progress report of the last session for up to 25 students.

IMPLEMENTATIONAL SUPPORT EVALUATION

The management system is easy to use and provides good control options. The reporting system is deficient however in that it is limited to 25 students, it does not diagnose areas of student weakness, it does not produce class lists, it does not have a security system, and it will not print hard copy results.

SUMMATION

Stickybear Math is a simple and easy to use drill and practice program on basic math facts. Its creative design makes the program interesting and motivating. Weaknesses of the program include a lack of corrective feedback, inability to enter carry and borrow numbers, a lack of animation in advanced levels, and a weak management system.

STATUS

"Stickybear Math I" has been authorized as a **SUPPLEMENTARY** learning resource for grades 1-4.

PURCHASE INFORMATION

This product may be purchased for $39.95 U.S. (1985) from Field Publications at the address given at the beginning of the report. Defective diskettes will be replaced free of charge within a 90 day warranty period. Thereafter, damaged diskettes may be replaced for $10.00. Backup diskettes may be purchased for $10.00 and a lab pack, consisting of five disks and one guide, is available for $75.00 U.S.

Due to frequent disk interaction, this diskette may be used on only one machine at a time.

STICKYBEAR NUMBERS

DESCRIPTION

Title: Stickybear Numbers
Authors: Richard Hefter, Janie & Steve Worthington
Publisher: Field Publications (formerly Weekly Reader Family Software)
Source: 245 Long Hill Road, Middletown, CT 06457
Subjects: Mathematics, Early Childhood
Topics: Counting
Components: 1 disk, teacher's guide (4p.), look book, poster, stickers
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, color monitor preferred
Other Formats Available (not evaluated): Commodore 64, Atari, IBM

Version: 1982
Display Language: English
Cost: $39.95 US (1985)
Tel. #: (203) 638-2400
Users : Grade 1

OBJECTIVES

The objectives of this program are to:

1. Reinforce counting and number recognition.
2. Stimulate observation, experimentation and exploration.
3. Provide children with a positive first experience with computers.

PEDAGOGICAL CONTENT DESCRIPTION

The student is instructed to depress any number from 0 to 9. The computer then generates an animated display, accompanied by sound, of the corresponding number of objects. If the space bar is pressed, one object will disappear and the number portrayed will be decreased by one. This process can be continued until the screen is cleared of objects. The space bar can similarly be used to count up from zero to nine. The depression of another number key begins the process again.

PEDAGOGICAL CONTENT EVALUATION

The content range, depth and sequence are appropriate for the intended audience. The program is generally effective in presenting the concept of counting and introducing the notion of addition and subtraction by incremental/decremental steps of one.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of depressing a number and then using the spacebar to reduce the number of objects shown to zero or to count from zero to nine. Approximately twenty randomized objects can be depicted. No quantitative feedback is provided; rather the computer increases or decreases the number of objects shown in correlation with the student's input. Program sequence, rate and amount are all user controlled.

INSTRUCTIONAL FORMAT EVALUATION

Student interaction is appropriate for the intents of the program. The user controls rate, sequence, and amount. Visual feedback is immediate and consistant. While no pre-tests or post-tests are included, this does not detract from program effectiveness.

TECHNICAL CHARACTERISTICS DESCRIPTION

High resolution color graphics with animation and audio are used.

TECHNICAL CHARACTERISTICS EVALUATION

The high resolution graphics with animation, color and audio are appropriate and motivating for the intended audience. While the program is more effective when run on a color monitor, the use of a monochrome monitor does not detract from program usefulness. Sound is interesting; however, the inability to disable it may prove a disadvantage in the classroom.

Displays are clear and well formatted, and transition from one display to the next is smooth. Some confusion exists when students are attempting to count moving objects which cross each other (e.g. fish, penguins, hearts); perhaps this cross-movement could be eliminated. Program strength could be improved by consistently encouraging left to right or top to bottom counting.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

The four page Parent's Guide contains a description of the program as well as a number of suggestions for additional activities. A hardcover book ("Look Book"), a colorful poster and eight stickers are included as student support materials.

IMPLEMENTATIONAL SUPPORT EVALUATION

The parent's guide describes the program adequately. User support materials provide reinforcement of the disk contents but are not integral to its use.

SUMMATION

Animated graphics and sound combine to make this program very interesting and motivating for the intended audience.

STATUS

"Stickybear Numbers" has been authorized for use as a **SUPPLEMENTARY** learning resource for grade 1 students.

PURCHASE INFORMATION

This product may be purchased for $39.95 US (1985) from Field Publications at the address given at the beginning of the report. Defective diskettes will be replaced free of charge within a 90 day warranty period. Thereafter, damamged disks may be replaced for $10.00. A backup diskette may be purchased for $10 and a lab pack, consisting of five disks and one guide, is available for $75.00 US.

Due to frequent disk interaction, this diskette may be used on only one machine at a time.

STICKYBEAR OPPOSITES

DESCRIPTION

Title: Stickybear Opposites
Authors: Richard Hefter
Publisher: Field Publications (formerly Weekly Reader Family Software)
Source: 245 Long Hill Road, Middletown, CT, 06457
Subjects: Language Arts, Early Childhood
Topics: Opposites
Components: 1 disk, teacher's guide (4p.), book, poster, stickers
System Requirements: Apple II+/IIe, 48K, 1 disk drive, color monitor preferred
Other Formats Available (not evaluated): Available in Apple format only

Version: 1983
Display Language: English
Cost: $39.95 U.S. (1985)
Tel. #: (203) 638-2400
Users : Grade 1

OBJECTIVES

This program is designed to:

1. introduce and reinforce the concept of opposites;
2. familiarize young children with the computer by encouraging exploration, discovery and hands-on experience.

PEDAGOGICAL CONTENT DESCRIPTION

This program uses high resolution, colored, animated graphics and sound to portray one of twenty-three pairs of activities. By using the paddles or by pressing certain keys the student can change the animated display to portray an opposite activity (e.g. a glass emptying and filling, a car going forward or backward, etc.) or a companion activity (e.g. having the concept of "up" and "down" illustrated by a bouncing ball and by a companion activity of a seesaw in motion). Each display has a name on it such as "high" or "low", "short" or "tall", etc.

PEDAGOGICAL CONTENT EVALUATION

Content range and depth are suitable for use with the specified target audience as well as with older students experiencing language delays. The animation effectively illustrates the concept of opposites even through younger children may not be able to read the words. The program is linearly sequenced with no progression from easy to difficult.

INSTRUCTIONAL FORMAT DESCRIPTION

Student's have the option of using game paddle or keyboard input. If the keyboard is used, the space bar is used to activate a new set of opposites while using the left or right arrow key, the numbers 1 and 2 or the letters "O" and "P" will produce the companion opposites.

Feedback is immediate and consistent but is not in the common form of a congratulatory message. Rather, if the student presses the correct key (s)he is rewarded by having the opposite activity initiated. Sequence is program controlled while rate and amount are user controlled. The program will endlessly draw random samples from its bank of twenty three pairs of opposites. The student terminates the program by shutting off the computer.

INSTRUCTIONAL FORMAT EVALUATION

Student interaction is appropriate for the age group. Questions are randomly chosen from a limited data base. No quantitative feedback is provided. The instructional technique is sound in that it effectively helps a child move from the concrete toward the abstract in grasping the concept of opposites in an interesting and motivating way. The program should provide the option of continuing after each of the pairs of activities have been displayed, otherwise some students will continue indefinitely.

TECHNICAL CHARACTERISTICS DESCRIPTION

The program uses high resolution, animated, colored graphics and sound. Combination upper/lower case, large size lettering is used.

TECHNICAL CHARACTERISTICS EVALUATION

The high resolution graphics complete with animation, color, audio and text are appropriate and effective for the intended audience. Although using a color monitor adds interest to the program, its use is not mandatory.

Displays are clear and well formatted and transition from one to another is smooth. Sound forms an integral part of the feedback, and so unfortunately can not be turned off. Its presence may be distracting in the classroom.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

User support materials include a "Yes and No" hardcover book, a poster, and eight stickers to help reinforce the concept of opposites.

IMPLEMENTATIONAL SUPPORT EVALUATION

User support materials help extend the concept of opposites into the child's environment.

SUMMATION

This program makes excellent use of high resolution graphics to effectively convey the notion of opposites in an interesting and motivating way.

STATUS

"Stickybear Opposites" has been authorized as a **SUPPLEMENTARY** resource for grade 1.

PURCHASE INFORMATION

This product may be purchased for $39.95 US (1985) from Field Publications at the address given at the beginning of the report. Defective diskettes will be replaced free of charge within a 90 day warranty period. Thereafter, damaged disks may be replaced for $10.00. A backup diskette may be purchased for $10 and a lab pack, consisting of five disks and one guide, is available for $75. U.S.

Due to frequent disk interaction, this diskette may be used on only one machine at a time.

STICKYBEAR SHAPES

DESCRIPTION

Title: Stickybear Shapes
Authors: Richard Hefter, Janie and Steve Worthington
Publisher: Field Publications (formerly Weekly Reader Family Software)
Source: 245 Long Hill Road, Middletown, CT 06457
Subjects: Mathematics, Early Childhood
Topics: Geometric shapes
Components: 1 disk, teacher's guide (4p.), shapes book, poster, stickers
System Requirements: Apple II+/IIe only, 48K, 1 disk drive, color monitor highly desirable.
Other Formats Available (not evaluated): Commodore 64, Atari

Version: 1983
Display Language: English
Cost: $39.95 US (1985)
Tel. #: (203) 638-2400
Users : Grade 1

OBJECTIVES

This program is designed to:

1. Identify and reinforce the recognition of five common geometric forms: circle, square, triangle, rectangle and diamond.
2. Familiarize young children with the computer by encouraging exploration, discovery and hands-on experience.

PEDAGOGICAL CONTENT DESCRIPTION

This program contains three games:

1. PICK-IT: Each picture display contains a missing shape. Students choose one of the five shapes displayed at the bottom of the screen (circle, square, triangle, rectangle, and diamond) in order to complete the picture.
2. NAME IT: From a choice of five shapes, students must choose one to match the name of the shape displayed.
3. FIND IT: Using the arrow keys, students match a sample shape presented at the bottom of the screen with a corresponding shape displayed in an array at the top of the screen.

PEDAGOGICAL CONTENT EVALUATION

Content range, sequence and depth are appropriate and effective for the upper range of the intended audience; however, three and four year olds will require adult intervention.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of a choice of using a paddle or the keyboard, selection of one of the three games from the menu, using a paddle or the arrow keys to input correct responses, using the space bar for page turning, and pressing ESCAPE to exit from a game.

Ten pre-programmed questions are used in "Pick It"; however, randomized questions drawn from a limited test bank are used in the remaining two programs. The user terminates a program by pressing the ESCAPE key.

Immediate feedback is provided after every response. Correct responses receive a picture which becomes animated and is accompanied by audio. Incorrect responses receive a low "bloop" and the user is encouraged to repeatedly try again until the correct response is found.

INSTRUCTIONAL FORMAT EVALUATION

The instructional technique is effective in developing and reinforcing the recognition and identification of five geometric shapes. Student interaction encourages a trial and error approach. While learning by discovery and experimentation may be desirable, it may not be a practical approach in a kindergarten/grade one setting where usually only a few computers are available.

The questioning technique used is appropriate; however, the data base is limited and students may lose interest with repeated use. Feedback is immediate and consistent. The addition of some form of quantitative feedback would strengthen this program.

The user appropriately maintains control of rate and amount.

TECHNICAL CHARACTERISTICS DESCRIPTION

High resolution, colored graphics accompanied by musical tones are used throughout the program. Large combination upper/lower case lettering is used for text.

TECHNICAL CHARACTERISTICS EVALUATION

The high resolution, animated graphics accompanied by sound prove very motivational for the target audience. Although the program is more effective when a color monitor is used, its use is not essential. Displays are clear and well-formatted. Transition is generally smooth; however, the sound which occurs between the displays in "Find It" should be eliminated. The use of sound in general may prove disruptive in a classroom setting; however, it is integral to the feedback of the program.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

The four page Parent's Guide contains a description of the program as well as a number of suggestions for additional activities. The support materials (a hardcover book called "Shapes" and eight stickers) are designed to expand the student's recognition of shapes.

IMPLEMENTATIONAL SUPPORT EVALUATION

The parent's guide describes the program adequately. The user support materials are useful for discussing and reinforcing the recognition of the shapes.

SUMMATION

Animated graphics and sound combine to make this program very interesting and motivating for the intended audience.

STATUS

"Stickybear Shapes" has been authorized for use as a **SUPPLEMENTARY** learning resource for grade 1 students.

PURCHASE INFORMATION

This product may be purchased for $39.95 US (1985) from Field Publications at the address given at the beginning of the report. Defective diskettes will be replaced free of charge within a 90 day warranty period. Thereafter, damaged disks may be replaced for $10.00. A backup diskette may be purchased for $10 and a lab pack, consisting of five disks and one guide, is available for $75.00 US.

Due to frequent disk interaction, this diskette may be used on only one machine at a time.

SUBTRACTING MIXED FRACTIONS

DESCRIPTION

Title: Subtracting Mixed Fractions
Author(s): Don Ross
Publisher: Microcomputer Workshops
Source: c/o CBS Interactive Learning, One Fawcett Place, Greenwich, CT 06836
Subjects: Mathematics
Topics: Least common denominator, borrowing from the whole number part, subtracting or reducing
Components: 1 disk, backup, teacher's guide (9p.), management system guide (9p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monitor
IBM PC family, 64K, monitor
Other Formats Available (not evaluated): TRS-80 Models III/IV, Atari, Commodore 64
Alberta Education Call No.: QA 117 S941 1984

Version: 1984
Display Language: English
Cost: $29.95 US (1985)
Tel. #: (203) 622-2500
Users: Grades 7 - 8

OBJECTIVES

This program is designed to give students practice in subtracting mixed fractions with unequal demonimators and to facilitate the understanding of the least common denominator and the different processes used to find it.

PEDAGOGICAL CONTENT DESCRIPTION

In this drill and practice program students are given practice subtracting mixed fractions having a value less than ten. Each problem is displayed on the top of the screen, a working area is provided, and a menu is depicted from which students choose the order in which the problem is to be solved (make a common denominator, borrow from a whole number part, subtract, or reduce the fractional part). Questions are presented in random order and students can choose to do up to 999 questions at one sitting.

PEDAGOGICAL CONTENT EVALUATION

The content range is appropriate for the target audience, however since this is a drill and practice program, students must have prior classroom instruction in the subtraction of mixed fractions. The randomized presentation of questions provides ample depth. While there is no overall sequencing from easy to difficult, within each question students must choose from a menu the steps to be taken in the completion of a problem, thus ensuring that they follow a specific sequence of procedures for problem solving.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of menu selection, the input of numerical answers, using the return key to advance to the next frame, and using the arrow keys to erase wrong entries. All questions are randomized. Incorrect menu choices result in a corrective statement explaining why the choice is inappropriate. Computational errors provide the response "Error in computation, NAME, try again". A second error results in the correct answer being provided. Upon completion of a set of questions, students are given a quantitative table which displays an error total for all of the questions.

A student who makes two errors in calculating the least common denominator is routed to a branch which illustrates how a lowest common denominator is found. The user is given a choice of three methods: 1) multiples of the denominator, 2) prime factors, or 3) both.

INSTRUCTIONAL FORMAT EVALUATION

Student interaction is consistent and appropriate for the target audience. The fact that students control both the number of questions and the rate of program presentation is a program plus. Corrective, non-threatening feedback is provided after each error and the quantitative error analysis provided at the end of each question set is useful for both teacher and student alike.

The terminology and sentence structure employed in some of the explanations may be confusing. For example, the instructions for finding the lowest common denominator read "List the multiples of each denominator up to the product of the denominators". The lowest common denominator is the smallest number that is a multiple of both denominators. Simplification may be in order, especially in view of the reading and comprehension abilities of the lower end of the target audience.

TECHNICAL CHARACTERISTICS DESCRIPTION

A split screen format is used on all questions: the top half of the screen displays the question and provides explanations and hints while the bottom half of the screen is used as a workspace. Highlighted areas and flashing cursors are used to guide the user through the progressive steps in the solution. Color and sound are not employed.

TECHNICAL CHARACTERISTICS EVALUATION

This program uses appropriate character size and make good use of highlighting and flashing to prompt the user for input. Transition between frames is quick and smooth.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

The nine page teacher's guide outline the program's objectives and provides a description of the program contents. The disk includes an optional management system with a capacity of six classes (35 students each) and provides five types of information: student name, student rank, student profile, class profile, and grade plot. Access to the management system is secured via a password.

IMPLEMENTATIONAL SUPPORT EVALUATION

The teacher's guide is clearly and succinctly written. The management system is excellent--it compiles a variety of data, it is easy to use, and it can produce screen or hard copy printouts.

SUMMATION

This disk uses the computer's abilities to provide step-by-step guided instruction in the problem solving process of subtracting mixed fractions. The management system is very comprehensive and provides data in various forms of ranking, in graphic form, and in a choice of soft or hard copy.

APPLE - IBM VERSIONS

Both the Apple and the IBM versions offer equivalent content and instruction, however minor differences are apparent: the Apple version offers a data management system which is not available on the IBM; students are limited to a maximum of nine questions in the IBM version whereas no limit is imposed in the Apple version; and, the IBM version offers minor technical enhancements including use of the space bar to highlight the fraction to be reduced (rather than manually entering it), providing a "Press S to Stop" option on each problem, and allowing an exit option via the main menu.

The IBM version requires that DOS be loaded and saved on the program disk upon initial use of the program (note that either DOS 1.1, 2.0, or 2.1 will work).

STATUS

The Apple and IBM versions of "Subtracting Mixed Fractions" have been designated as **SUPPLEMENTARY** learning resources for grades 7 & 8.

PURCHASE INFORMATION

This product may be purchased for $29.95 U.S. (1985) from CBS Interactive Learning at the address given at the beginning of the report. Lab packs are available in the following quantities and prices: 10 copies @ 3 x list price; 15 copies @ 4 x list price; 20 copies @ 5 x list price; 25 copies @ 6 x list price. The company provides a life time guarantee against defective diskettes and will replace worn out diskettes without charge at any time.

The disk has the advantage of being capable of operation with more than one machine (if access to the management system is not needed); however, such use is subject to copyright laws and any license or purchase agreement.

T. REX

DESCRIPTION

Title: T.Rex: The Dinosaur Survival Adventure
Author(s): Keron Productions Inc
Publisher: CBS Interactive Learning
Source: One Fawcett Place, Greenwich, CT 06836
Subject: Science
Topics: Study of dinosaurs
Components: 2 disks, teacher's guide (48p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, color monitor preferred, joystick (optional)
Other Formats Available (not evaluated): IBM PC/PCjr, Commodore 64
Alberta Education Call No.: QE 862 .D5 T817 1984

Version: 1984
Display Language: English
Cost: $49.95 U.S. (1985)
Tel. #: (203) 622-2525
Users: Grades 5 - 6

OBJECTIVES

The object of this program is to keep a dinosaur alive for five hundred time units by monitoring its body needs, meeting them and monitoring the terrain for food and movement difficulty. This is in an attempt to solve the mystery of why the Tyrannosaurus Rex did not survive.

PEDAGOGICAL CONTENT DESCRIPTION

This program covers role playing simulations of the Tyrannosaurus Rex. The users develop survival knowledge as they discover the needs of the dinosaur under varied environmental conditions. In using the program the user may select one of four levels, each of which increases in difficulty. In levels one and two, the user must monitor food, health and energy. Level one provides hints as you play the game but no hint messages are provided in level two. In level three, two new environments are added, the desert and rain forest, as well as a scale of body water level and body temperature. Traps such as tar pits are added in level four. Help is available to the users. A "what if" section allows modification of speed, air temperature, health, prey, food and water. An introduction disk provides a demonstration of how to play the game.

PEDAGOGICAL CONTENT EVALUATION

Content range and depth are both appropriate for the target audience, although very young students with limited reading ability may find level four difficult. The four levels are sequenced so that each level introduces one or two new aspects of dinosaur survival. The content is accurate and free of bias. The vocabulary used in the screen commands is easy to understand with the exceptions of the small poems presented when the dinosaur dies. The visual images are relevant and the content is appropriate to the medium.

INSTRUCTIONAL FORMAT DESCRIPTION

The student interacts with the program through menu selection and student input by using a joystick or arrow keys, space bar and question mark. The right and left arrows turn the dinosaur 180 degrees and control the speed. The space bar controls dinosaur actions of attacking and drinking. The question mark accesses the help screens and is used to adjust game parameters in the "what if" portion to modify the program.

Feedback is provided at each level. At level one appropriate and inappropriate actions are explained by HELP messages which appear at the top of the screen. If the user is successful within the 500 time units at any level, (s)he is congratulated and gains experience points which makes Tyrannosaurus Rex stronger and more efficient at moving. The pace of the game increases with length of play. If the Tyrannosaurus dies, a short poem is presented followed by an explanation of why the dinosaur died.

INSTRUCTIONAL FORMAT EVALUATION

Student interaction is appropriate and effective for most of the target audience with the student being actively involved in role playing. However, the younger users may find the program somewhat difficult to use and the use of a joystick rather than keys may be easier. The higher levels provide sufficient challenge that a considerable amount of practice will be required in order to be successful. The users learn how basic ecology principles operate in the relationships between the tyrannosaurus and environmental conditions as well as other factors in the environment such as predators, abundance of food supply, etc. Since the program can be paused or saved at any point, it does not over tax the user. It is noted that when selecting levels or new games the program does not allow the user to correct an entry.

The "what if" section allows the user to change or manipulate the content and this adds a very interesting aspect to the program. The status report and help screens provide helpful information when it is required.

TECHNICAL CHARACTERISTICS DESCRIPTION

High resolution graphic and color are used extensively in this program. Sound is optional. The HELP sections make use of upper and lower case letters in standard and enlarged print.

TECHNICAL CHARACTERISTICS EVALUATION

The use of graphics and color are appropriate and effective. A color monitor is recommended for maximum effectiveness in this program. The character size is appropriate but a typographical error is noted; "tine" is used for "time". It is noted by one analyst that the movement up and down of the tyrannosaurus by means of the arrows keys on an Apple IIe does not always work effectively. The use of a joystick may be better. It is sometimes difficult to discern the environmental changes so the user must constantly consult the status screen, e.g. when in a river or drinking at a swamp the status screen says it is in the middle of a savanna.

The program appears to be reliable and students will require little teacher assistance.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

There are no special prerequisite skills required, but the introduction disk which describes the program and runs samples of typical interactions can be used as an orientation to the program. No management system is included.

The teacher documentation provides instructions, hints and strategies as to how to play the game and gives information about dinosaurs and conditions relating to their survival and extinction. A glossary and a reading list are also provided. No user support materials are provided.

IMPLEMENTATIONAL SUPPORT EVALUATION

Using the introductory disk and reading the booklet would help to make this program effective in the classroom. Initially some younger users may find this material too difficult if it is done on their own. Once a student is familiar with the intent of the program and the keys for manipulation, there should be little difficulty in using the program. It is noted that on occasion there is an unclear sign on procedure, e.g. when a user starts a new game, "Yes" is highlighted, RETURN has no effect; the user must type "Y".

The documentation contains the necessary information for this program to be used by a teacher with minimum computer competency.

SUMMATION

The major strength of this program is the active participation of the student in manipulating environmental conditions in order to have his/her dinosaur survive. Although a game format is used, considerable thought is required to develop relationships and an understanding of the balance between ecology and survival. Teacher intervention would be advisable to ensure that the user has gone beyond the game playing and has in fact grasped the relationships between the variables. The program with its different levels allows for a large range of users. The animation is generally very good but it is unfortunate that some visual displays are not clearer as to the type of terrain and movement factors. The "what if" section adds an interesting and challenging dimension to this program.

The lack of user control in the page turning in the Introduction disk and during the HELP section is somewhat annoying to the faster student. The lack of correction of entry when a user wishes to choose another level or start a new game is a weakness.

STATUS

"T. Rex" has been designated as a **SUPPLEMENTARY** learning resource for Grade 5 and 6 students.

PURCHASE INFORMATION

This product may be purchased for $49.95 U.S. (1985) from CBS Interactive Learning at the address given at the beginning of the report.

Defective diskettes will be replaced without charge within a 90 day warranty period. Subsequently, inoperable disks may be purchased for $6.50 U.S.

Frequent disk interaction prevents use of the disk with more than one machine at a time.

TOUCHTYPE

DESCRIPTION

Title: Touchtype
Author: Harvey R. Brown
Publisher: Software Spirit
Source: Box 825, Spirit River, Alberta T0H 3G0
Subject: Business Education/Applications

Version: 2.0 (1985)
Display Language: English
Cost: $75 (1985)
Telephone: (403) 864-3608
Users : High School +

Components: 1 disk, 1 back-up, reproducible user s guide (55p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monochrome monitor, shift key modification, 80 col. card
Optional Hardware/Software: Uses up to 212K memory provided sufficient memory cards are added, 2 or more disk drives
Other Formats Available (not evaluated): Available in Apple format only
Alberta Education Call No.: HF 5548.115 B878 1983

EDITOR DESCRIPTION

Three cursor modes (text entry, editing and insert/delete mode) each have their own distinctive cursor. Cursor movement is accomplished either by using the arrow keys on the Apple IIe or by using the I, J, K, & M keys in conjunction with the ESC key on the Apple II+. ESC H and ESC L allows fast horizontal movement while ESC U or ESC N will enable quick scrolling one screen at a time. File names can be up to 23 characters long. A catalog disk contents is kept in memory at all times (does not need to be disk accessed after initial loading) on which up to 60 files are consecutively numbered. Files can be loaded by number rather than by name. Blocks of text up to 49 lines in length can be moved from one location to another. In addition, the user may have two separate files in memory at the same time (e.g. addresses in one file, a form letter in another) and text can be moved from one file to another. The global search and replace feature can be automatically or manually invoked but reformatting is usually necessary after using it unless both the search word and the replace word are precisely the same length. The program has the unique feature of allowing text to be entered in vertical format.

EDITOR EVALUATION

Document creation is straightforward and switching from one file to another in memory is a relatively easy process. The ability to load files by number is a time saver. Scrolling is efficiently accomplished. The program has excellent buffer capacity that enables a series of lines or rectangular blocks of material (e.g. a column of numbers) to be moved and inserted vertically, horizontally or integrated with other material. Since the editor retains two files in memory, it is possible to move from one file to another without accessing the disk. The search and replace function operates in forward motion only and strings are limited to one line in length; moreover, the replace command does not always restore proper format when a short string is replaced by a long one and reformatting is often needed. Since each alphabetic key takes on a different function in each of the three available modes, gaining initial familiarity with the program is time consuming.

Several special features uncommon to other word processors in this price range are available: a "Number X" command numbers paragraphs or test questions; a "Word" command allows automatic entry of any word or phrase of up to 70 characters with a single keystroke; "ESC Y" aligns a column of figures (decimally); "ESC V" allows vertical text entry mode; embedded commands enable sub/superscripting, newspaper column format is available; and, depending upon the quality of printer with which it is linked, several type fonts are also available. In addition the program offers an alphabetization feature which sorts lists alphabetically with amazing speed.

FILE MANAGEMENT DESCRIPTION

Data disks are initialized from the master diskette and the assignment of both a name and a volume number provides for data organization. On a 48K computer, document length is limited to 6 pages, 64K to 12 pages, and on a 128K to 36 pages. The program will make use of up to 212K provided sufficient RAM cards are installed. "Touchtype" is presently compatible with Applewriter, Magic Window, Sensible Speller and VisiCalc files. It can load files from any other word processing system which stores its files in DOS 3.3 text or in binary files.

FILE MANAGEMENT EVALUATION

The use of file numbers and the first two letters of a command to load files proves efficient. There are good interface capabilities and the fact that data is stored in standard DOS 3.3 binary files enables transmission by most modem software. The maximum line length of 80 characters, while satisfactory for most business applications, does not fully utilize the capabilities of most printers. The fact that there is no password security system may prove a limitation in some classroom applications.

PRINT FORMATTER DESCRIPTION

Default margins (66 characters) can be user changed, an unlimited number of tabulations can be set and single or double line spacing is available.

The program will automatically paginate; however, no widow protection is offered. Word wrap is automatic but can be disabled. Underlining, subscripts, superscripts and boldfacing are achieved via a control character to begin and end each of these attributes. No hyphenation is available. Screen display closely approximates the printed page and a LENGTH command will provide an immediate count of the number of words in a document to a maximum of 65,536 words.

PRINT FORMATTER EVALUATION

Since text is formatted on entry, the program offers a good "true to printer" screen display. The on-screen display of pagination eliminates surprise in the hard copy printout of the text. It does not appear to be possible to reformat text entered without word wrap into a re-formattable word wrap display. Print options are excellent, although it is time consuming to learn to use the embedded commands.

Centering is limited to between margins only. Justification is available but it is tedious since the cursor must be moved through each line to be justified.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

The reproducible manual offers a table of contents, an index and an overview of the programs features. Tutorials on the master disk review essential operating procedures and allow the user to try them out. Program updates are available at $5.00 per disk.

IMPLEMENTATIONAL SUPPORT EVALUATION

Explanations of functions are reasonably good; however, the presence of 'walk through' exercises would be advantageous.

EASE OF USE EVALUATION

Commands are numerous and are not always mneumonic; however, a built-in help screen of editor commands is available which, once loaded, is immediately accessible without further disk interaction. Sample files included on the disk show the program's possibilities, including print options. The user's guide provides essential operating information; however, the user should expect to spend considerable time at the keyboard exploring the available functions before (s)he will be able to edit his/her first document. It would likely take several weeks of concentrated use before the user would be comfortable with all of the available commands.

The program will automatically configure on all members of the Apple II family; however, it operates most efficiently with 64k memory or more. Since the program is written entirely in machine language, it offers good operational speed.

SUMMATION

"Touchtype" is designed for the serious word processing operator interested in advanced business applications. It is a powerful word processing program compared with others in the same price range. A constant display of commands eliminates the need to memorize them, and a disk tutorial program aids in their initial acquisition. While the documentation is reasonably good, users must be prepared to spend hours at the keyboard experimenting with the functions available in order to effectively utilize the available options.

STATUS

"Touchtype" has been designated as a **RECOMMENDED** learning resource for Bus. Ed. 10/20/30.

PURCHASE INFORMATION

Alberta schools may purchase this product from the School Book Branch for approximately $65 (1985). Defective diskettes will be replaced within a 30 day warranty period. Thereafter, diskettes may be replaced for approximately $10.00. Note that the package comes with a backup diskette.

This product is an update of "Touchtype" version 1.3 which was given a Recommended status in the 1985 edition of "Computer Courseware Evaluations". Schools wishing to acquire the updated version may do so by returning the old version to Software Spirit at the address given at the beginning of the report. The update costs $7.00

TRANSVERSE WAVES

DESCRIPTION

Title: Transverse Waves
Authors: J. Kimmitt & J. Tesh
Publisher: Heinemann Computers in Education
Source: c/o Gage Publishing Ltd., 164 Commander Blvd, Agincourt, ON M1S 3C7
Subject: Science
Topics: Transverse waves - interference, reflection and beats
Components: 1 disk and backup, manual (14p.)
System Requirements: Apple II+/IIe only, 48K, 1 disk drive, monochrome monitor
Other Formats Available (not evaluated): Available in Apple format only

Version: 1982
Display Language: English
Cost: $85.00 (1985)
Tel. #: (416) 293-8141
Users : Grade 11

OBJECTIVES

Students will be able to:

1. Understand transverse waves in terms of discrete particles.
2. Relate wavelength, frequency and velocity of transverse waves.
3. Explain interference and beats.
4. Describe reflection of a wave from a rigid boundary.

PEDAGOGICAL CONTENT DESCRIPTION

This program is designed as a simulation of a transverse wave where the wave properties can be controlled by the user. Display options allow the user to vary amplitude, wavelength, velocity, display speed and number of particles of the medium shown. As well, one, two or the sum of two waves can be displayed with or without axes. The program allows the user to explore either the effects of interference or reflection (including interference of waves moving in opposite directions) or beats (complex regular vibrations).

PEDAGOGICAL CONTENT EVALUATION

Since this program does not include a tutorial or any definition of terms, prior classroom teaching of the concepts of oscillation, amplitude, frequency, periodic time, and velocity is mandatory. The program is designed as a user controlled simulation and as such the range, depth and sequence are flexible and to a large extent controlled by the user. The illustrations and control of parameters are excellent with unlimited experimentation possible. The program could be used effectively as a teacher controlled demonstration at several levels of difficulty.

Since this program is produced in England, some connotative differences are evident. For example, this program uses the term "beats" to describe all "regular complex vibrations" whereas we limit it to interference of sound waves (longitudinal waves). Also the section on reflection does not deal with reflection in terms of the angle of incidence equalling the angle of reflection, but rather illustrates the interference of waves moving in opposite directions.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of selecting menu choices, entering wave length parameters, and setting display modes. ESCAPE is used to switch to the parameter screen or to the main menu and the space bar is used to go to the graphic display or to stop and restart the wave motion. Feedback consists of a graphic display using the student selected parameters. If a student's input is outside the acceptable range, a beep and message are used to indicate an invalid entry. The user has total control of rate, sequence, and amount.

INSTRUCTIONAL FORMAT EVALUATION

Assuming that students have the prerequisite knowledge of the concepts of amplitude, frequency, periodic time and velocity (as identified in the user's manual), this program provides an excellent demonstration of concepts which are difficult to experimentally produce. A prime advantage of the format is that the topic of transverse waves can be investigated at several different levels from an introduction to the nature of a transverse wave to more complex properties such as beats. The program by its nature is not meant to be a complete instructional unit but rather to be a supplement to classroom instruction.

TECHNICAL CHARACTERISTICS DESCRIPTION

This program uses high resolution graphics and animations for displays of wave motion. Transverse waves are presented on a screen divided into three sections. The top two portions of the screen display two different transverse waves while the larger bottom section is used to display the sum of the two waves. A horizontal axis for all three waves may be displayed as a user option. The wave motion can be frozen at any point for further study.

Color is not used in the program. Sound consists of beeps to indicate that a user's input is incompatible with a predetermined range of responses. Combination upper/lower case text in presented in standard size.

TECHNICAL CHARACTERISTICS EVALUATION

The displays are clear and well formatted with excellent flexibility in choosing the amount of detail and the speed of the display. The ability to enter only the first letter or the first two characters of a parameter name makes the program fast and easy to use. The ability to change the phase relationship "on the go" is a very useful and effective part of this program.

SUMMATION

When used in conjunction with classroom instruction and regular laboratory activities, this program is an excellent visual aid to explain the concept of transverse waves. It can be effectively used by the teacher as a demonstration tool; by individual students to explore the concepts of interference, reflection, or beats; or, because of the flexibility it allows, it could be particularly useful as an enrichment tool for the above average physics student. Unfortunately, the price is somewhat high.

STATUS

"Transverse Waves" has been authorized as a **SUPPLEMENTARY** learning resource for Physics 20.

PURCHASE INFORMATION

This product may be purchased for $85.00 (1985) from Gage at the address given at the beginning of the report. Damaged diskettes may be replaced free of charge within a 90 day warranty period. Subsequently, damaged disks may be replaced for $52.95.

This disk has the advantage of being capable of use with more than one computer at a time; however, such use is subject to copyright laws and any license or purchase agreement.

VIDEO GALLERY

DESCRIPTION

Title: Video Gallery Sales & Service: An Automated Accounting Simulation
Author(s): Dale Klooster & Warren Allen
Publisher: Southwestern Publishing
Source: *c/o Gage Publishing*, 164 Commander Blvd, Agincourt, Ontario M1S 3C7
Subjects: Business Education
Topics: Simulation of a computerized general ledger, accounts receivable & accounts payable
Components: 1 disk with backup, teacher's guide (39p.), student's guide (59p.)
System Requirements: Apple II+/IIe/IIc, 48K, 2 disk drives, monitor, printer
Other Formats Available (not evaluated): IBM PC, TRS-80 Models III/IV

Version: 1984
Display Language: English
Cost: See end of report
Tel. #: (416) 293-8141
Users: Grades 10 - 11

OBJECTIVES

This automated accounting simulation is designed to provide a realistic simulation of a one month period of employment as an accounting clerk in a wholesale video supply company.

GENERAL LEDGER DESCRIPTION

Using both a workbook and a diskette, students are introduced to computerized accounting via an integrated general ledger system, an accounts payable system and an accounts receivable system. The simulation is specifically written to be used as a review exercise after completing the first sixteen chapters of Century 21 Accounting . In approximately 5 - 7 hours, students simulate the financial operations of a video sales company for a one month period and use the microcomputer to process accounting transactions which involve purchases and sales on account, correcting and adjusting entries, sales discounts, credit terms and purchase discounts.

After transactions are recorded in a journal, accounts in the general ledger are automatically posted. Debits are positive numbers; credits are negative numbers. Although individual ledger accounts cannot be printed, a chart of accounts can be accessed. Accounts are sorted by number; therefore, reference to accounts for entries or corrections must be by number rather than by name. A proof of equality is continuously displayed throughout the journalyzing process, and a journal entry proof can be displayed/printed to check accuracy before printing.

The reports generated by the program include an income statement, a trial balance and a balance sheet.

GENERAL LEDGER EVALUATION

This package offers well-sequenced, progressive practice in recording the financial transactions for a one month period. Students can easily access systems by single key selections of options presented in main or sub-menus. Instructions are explicit, student interaction is frequent & consistent and feedback is immediate. (Error messages are number coded however, and must be referenced in the student manual for a full explanation.) Reports and statements are consistent with general accounting expectations. The program is flexible in that it allows adding, changing or deleting of accounts from the chart of accounts; however, it is unfortunate that ledger accounts must be accessed by number rather than by name and that they can not be individually printed.

As this simulation is designed as a practical review exercise of introductory accounting principles, prior classroom instruction in basic accounting principles is mandatory.

Concerns about content include the fact that documents cannot be visually checked for accuracy on the screen prior to printing, worksheets are not included, and payroll, an integral part of all business operation, is not specifically addressed. Also, the program has a tendancy to "lock up" (necessitating data re-entry) if one tries to print a report when the printer is not turned on.

ACCOUNTS RECEIVABLE/ACCOUNTS PAYABLE DESCRIPTION

The Accounts Receivable portion of this program prints a sales proof, a cash receipt and credit memo proof, an A/R ledger by customer and customer statements. Accounts Payable generates an accounts payable ledger, an A/P transactions proof, prints checks and maintains a check register.

ACCOUNTS RECEIVABLE/ACCOUNTS PAYABLE EVALUATION

The program is limited in the statements it produces--it does not print aging reports, discounts, schedules of accounts receivable/payable, customer credit profiles, etc. It would be nice if overdue balances or expiry dates on discounts could be flagged to draw attention to them. The checkwriter can be utilized at any point in the program; however, no safeguards have been incorporated to restrict the duplication of previously written cheques.

The program depends upon heavy disk interaction while files are loaded or updated and while processing takes place. Since entry is prohibited until a cursor reappears, this waiting time can prove frustrating.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

The student manual contains sections on error codes, program description and operator action. Numerous examples and displays are provided. The teacher's manual includes teaching suggestions, a test generating program, a trouble shooting section and answers to disk/workbook exercises.

IMPLEMENTATIONAL SUPPORT EVALUATION

The student workbook is integral to package design and, provided students read it carefully, they should be able to operate the program with little teacher intervention. The introduction provides users with a convincing argument for the use of an electronic accounting system and offers a comparison to the manual system. A section on BASIC operating concepts, which proves helpful to the novice user is also included. Exercises are clearly and concisely written and include example to "walk" a student through the problem solving process. The teacher's manual contains helpful classroom implementation suggestions, test generating procedures and solutions to workbook exercises.

SUMMATION

This program provides an effective review of introductory computerized accounting principles. It is a costly program since it is limited to one disk/student at a time.

STATUS

"Video Gallery" has been authorized as a **SUPPLEMENTARY** learning resource for Accounting 10/20.

PURCHASE INFORMATION

Package parts can be purchased separately for the following prices: text/workbook - $4.45; teacher's manual - $2.80; individual diskette and backup - $62.90; driver diskette - $88.10. Individual diskettes can be used by only one student as his/her data is entered directly on the diskette. After (s)he has finished the course, another student may use the diskette. A driver diskette allows use by different students as data is entered on their own data diskettes. However, the driver diskette can be used with only one computer at a time.

Defective diskettes will be replaced without charge within a 90 day warranty period. There is no warranty for disks which become inoperable through normal use.

THE VISIBLE COMPUTER: 6502
THE VISIBLE COMPUTER: 8088

DESCRIPTION

Title: The Visible Computer: 6502 / The Visible Computer: 8088
Author(s): Charles Anderson
Publisher: Software Masters
Source: P.O. Box 3638, Bryan, Tx 77805
Subjects: Computer Science
Topics: Machine language programming, simulation of the 6502/8088 microprocessor
Components: 6502 - 1 disk, user's guide (156p.), assyst assembler (23p.) 8088 - 1 disk, user's guide (337 p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monitor; IBM PC, 64K, monitor
Other Formats Available (not evaluated): Commodore 64

Version: 1984/1985
Display Language: English
Cost: $49.95 US (1986)
Tel. #: (409) 822-9490
Users: Grades 10 - 12

NOTE:

This report is based on an evaluation of the Apple version of the product. See the end of the report for a comparison to the IBM version.

OBJECTIVES

This program is designed to simulate the operation of the 6502 microprocessor and thus provide a systematic way to learn machine language programming.

PEDAGOGICAL CONTENT DESCRIPTION

This package consists of a 156 page book together with a disk which illustrates the functioning of the 6502 microprocessor in carrying out machine language programs. The sixteen chapters of the textbook explain and describe the commands and programs illustrated on the disk. Chapters 1 and 3 provide an explanation of the function of the hardware of a computer in relation to machine language, chapter 2 explains the decimal, binary, and hexidecimal numbering systems, chapters 4 and 5 describe the operation of the TVC simulator, chapters 6 - 14 progressively lead the user through a series of 25 illustrative programs which demonstrate the 151 op codes defined for the 6502, chapter 15 challenges the user to write programs in machine language, and chapter 16 suggests methods of debugging and interfacing basic with machine language.

PEDAGOGICAL CONTENT EVALUATION

The content of this program is suited to highly motivated, academic high school students. While no prerequisite is mandated, the program assumes the user has some familiarity with basic programming and a Computer Processing 10 background would, therefore, be highly recommended. The range, sequencing and depth of the program are appropriate to a mature audience and would likely take up to 50 classroom hours to complete. The textbook is written in a clear and concise manner and subtle humor is used to add interest to what could otherwise be a tedious explanation of disk programs. The content is very accurate, even to the point of simulating bugs which were identified and still remain in the real 6502 microprocessor. In addition, the content is current and contains updated information on the Apple IIe and IIc.

The textbook and the disk MUST be used conjunctively--either component used alone would have very limited functionality.

INSTRUCTIONAL FORMAT DESCRIPTION

Students interact with the program by running the sample programs contained on the disk and by experimenting with them in accordance with the suggestions provided in the textbook by changing variables or by inputting different values and observing the results. Provided the textbook sequence is followed, students will learn a very complex subject in a well-incremented manner. Students observe the changes the new inputs cause and draw conclusions from their observations. Rate and amount of presentations are totally under user control.

INSTRUCTIONAL FORMAT EVALUATION

The intricate challenges of machine language programming are likely of interest and value to only a minority of motivated students, however this program does provide motivational instruction for this specialized group of users. The thirty programs contained on the disk effectively illustrate the principles outlined in the text and the ability of the user to set rate controls enables the programs to be viewed at a greatly reduced speed, thus allowing each step of the microcomputer processing process to be clearly identified. The program does not contain feedback, questioning or testing per se, however it does promote intrinsic thought and analysis.

TECHNICAL CHARACTERISTICS DESCRIPTION

This program uses a 40 column screen display to simulate the operation of the 6502 microprocessor. Users can choose upper or lower case lettering. Graphics are used to draw boxes on the screen as required. A printed copy of the final output can also be accessed.

TECHNICAL CHARACTERISTICS EVALUATION

The area of machine language programming is very technical and, in general terms, would not be considered user friendly. However within the context of the limited target audience specified earlier, the technical characteristics of this program are appropriate. The program makes effective use of graphics to display and highlight information. Windowing and selective erasing are used appropriately.

While the addition of color and sound might add clarity, their absence is not a major detriment. The fact that a user can easily exit and return at a later time is a program plus.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

The first 130 pages of the textbook correlate with disk programs. In addition 26 pages of appendices offer additional technical explanations of some of the terms referenced in earlier parts of the book (e.g. TVC memory map, ASCII character set, monitor commands, etc.). The text also devotes 23 pages to an explanation of "ASSYST: The Assembler System", a utility editor/assembler program for creating 6502 assembly language programs on the Apple family of computers.

IMPLEMENTATIONAL SUPPORT EVALUATION

The user's manual and disk form a complete, independent, tutorial-style study unit. Wile the user guide is well-written and witty, it is also demanding. It lacks an index, chapter overviews, and summaries, but it offers a good set of appendices. A teacher's manual is not offered.

It is unfortunate that while the textbook suggests the "ASSYST: The Assembler System" as an invaluable aide to programming in machine language, the accompanying disk is NOT included.

SUMMATION

The contents of this learning package are suited for use with a small number of highly disciplined high school students who are interested in learning machine language programming. The lack of questioning and feedback inhibit use for any but keenly interested, self-motivated users.

APPLE - IBM VERSION

While the content of the IBM version is different from that of the Apple version, the products are similar in concept and in treatment of the material. The IBM manual is considerably larger and, as such, is more complete in terms of the material provided and detailed explanations of the concept taught. As with the Apple version, success of the program is dependent on the quality of the manual. This manual (337 pages) is well written, with humour, and its 34 chapters leaves few concepts untouched. Reading level is appropriate for advanced students with some knowledge of the computer. Material is presented in a logical and orderly sequence so that the learner is not swamped with too much information to be able to cope with it properly. A 90 page reference section at the end of the book provides much useful information as well.

STATUS

The Apple and IBM versions of "The Visible Computer" have been authorized as **SUPPLEMENTARY** learning resources for Computer Literacy 10 and Computer Processing 10 - 20 - 30.

PURCHASE INFORMATION

Either version of the product may be purchased for $49.95 U.S. (1986) from Software Masters at the address given at the beginning of the report. There is also an unprotected version of the IBM product which can be purchased for $79.95 U.S. (1986). After the full package has been purchased, additional diskettes may be acquired for $10 (IBM) or $5 (Apple). Defective diskettes will be replaced free of charge within a 90 day warranty period. Thereafter, disks may be replaced for a charge of $10 (IBM) or $5 (Apple)

This disk has the advantage of being capable of operation on more than one machine provided that only one activity is accessed; however, such use is subject to copyright laws and any license or purchase agreements.

WAVE ADDITION II

DESCRIPTION

Title: Wave Addition II
Author: David Vernier
Publisher: Vernier Software
Source: 2920 SW 89 Street, Portland, OR 97225
Subject: Science
Topics: Superposition of waves
Components: 1 disk (unprotected), manual (18p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, color monitor preferred
Other Formats Available (not evaluated): Available in Apple format only.
Alberta Education Call No.: QA 927 W356 1983

Version: 1983
Display Language: English
Cost: $24.95 U.S. (1984)
Tel. #: (503) 297-5317
Users : Grades 11 - 12

OBJECTIVES

The program is designed to demonstrate how waves add together according to the superposition principle.

PEDAGOGICAL CONTENT DESCRIPTION

This program consists of ten modes incorporating demonstrations, tutorials, or user interactive programs designed to illustrate how waves add together according to the superposition principle. Beats, constructive and destructive interference, formation of musical notes and Fourier synthesis are covered.

The modes offered are:

0. General instruction
1. Demonstration of Addition of Two Waves
2. Addition of Two Waves
3. Demonstrations of Beats
4. Addition of Four Waves
5. Explanation of Fourier Synthesis
6. Demonstration: Synthesis of a Square Wave
7. Demonstration: Synthesis of a Sawtooth Wave
8. Demonstration: Synthesis of a Triangular Wave
9. Fourier Synthesis of up to Nine Waves.

The general instruction (#0) provides abbreviated instructions for using the program. Some of the remaining programs are demonstrations in which the computer adds pre-programmed waves in order to demonstrate a specific wave phenomenon. In other modes, the user selects the waves to be added. After the waves to be added are selected, each wave is drawn and then the results of the superposition is displayed.

The manual defines terminology, presents a brief description of each mode, outlines disk operation, outlines prerequisite knowledge required, suggests possible program modifications and provides information on the program listing.

PEDAGOGICAL CONTENT EVALUATION

The content range is appropriate for the target audience and is well sequenced from simple addition of two waves to complex Fourier syntheses. This program is essentially designed as a demonstration tool using graphic simulations to illustrate basic wave characteristics (frequency, amplitude, wave length, phase angle, etc.); however, the explanation of functions performed by each section and the number of options within each section help to increase the versatility of the program. These enable the program to operate very smoothly and, with some prior instruction, it can stand on its own.

INSTRUCTIONAL FORMAT DESCRIPTION

A brief introduction explains each mode; students then select the program they wish to use from the main menu. The demonstration/tutorial programs only require pressing the RETURN key to activate page turning; the interactive programs require numerical input of the operating parameters.

At the end of a run, the user may elect to redraw the same wave addition diagram on the same scale or redraw it on an expanded horizontal scale. When selecting a mode, the user may choose to control the pace of the displays or may choose to cause the summation of waves added so far to be displayed on a separate graphics screen.

Since this program consists solely of demonstrations, traditional questioning techniques and feedback are absent. The result of any input is either a new page of text or the graphing of a simulation for which the parameters have been specified.

INSTRUCTIONAL FORMAT EVALUATION

The overall instructional technique is effective for classroom demonstration/discussion and also for enrichment experiences for students wishing to experiment with Fourier syntheses.

TECHNICAL CHARACTERISTICS DESCRIPTION

This program utilizes upper case standard text combined with high resolution graphics for wave depictions with a maximum of four colors used for differentiation. The introduction uses upper and lower case high resolution text.

TECHNICAL CHARACTERISTICS EVALUATION

Input methods are consistent, but further information on how to enter the data and the size of the desired parameters might be beneficial. While the program can be adequately run on a monochrome monitor, use of a color monitor does add clarity when several waves are plotted. Still, the screen can get cluttered and thus confusing when a large number of waves are drawn.

SUMMATION

This program makes effective use of the computer to generate graphical demonstrations of wave addition and superposition to provide a conceptual basis of study of the many standard, observable properties of waves.

STATUS

"Wave Addition II" has been designated as a Supplementary learning resource for Physics 20 & 30.

PURCHASE INFORMATION

This product may be purchased for $24.95 U.S. (1984) from Vernier Software at the address given at the beginning of the report. Note that the programs are not copy protected and schools may make as many copies of the program as they wish for use within that school. Should replacement be necessary by Vernier Software, there would be a charge of $3.00 per disk.

WAVE DEMONSTRATIONS

DESCRIPTION

Title: Wave Demonstrations
Series: Waves and Vibrations
Author: G. MacRae
Publisher: Merlan Scientific
Source: 247 Armstrong Ave., Georgetown, ON L7G 4X6
Subject: Science
Topics: Periodic transverse waves, reflection, interference and standing waves on a string
Components: 1 disk and backup, user's guide (1p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monochrome monitor
Other Formats Available (not evaluated): Commodore Pet & 64

Version: 1983
Display Language: English
Cost: $32.00 (1985)
Tel. #: (416) 877 - 0171
Users : Grade 11

OBJECTIVES

The program is designed to provide a visual aid for the instructor in demonstrating wave behaviour using transverse waves.

PEDAGOGICAL CONTENT DESCRIPTION

The program uses transverse waves to demonstrate the following properties:

1. Constructive interference
2. Destructive interference
3. A wave train
4. Reflection of a wave
5. A standing wave with up to 6 patterns.

The teacher selects the concept to be displayed from a menu and the program then shows the appropriate waveform. The user may freeze the frame, continue with the display or repeat as desired. In the standing wave demonstration mode, the user has the additional option of selecting the number of mode "loops' to be displayed and whether or not (s)he desires the display to be shaded to show the static standing wave.

PEDAGOGICAL CONTENT EVALUATION

The content is clear, accurate and concise but is limited in the scope presented.

INSTRUCTIONAL FORMAT EVALUATION

The program is designed as a demonstration and as a result there is no instructional design.

TECHNICAL CHARACTERISTICS DESCRIPTION

Animated graphics and text are both presented in high resolution mode.

TECHNICAL CHARACTERISTICS EVALUATION

The displays demonstrate excellent use of graphics.

SUMMATION

As a demonstration tool, the graphic displays are excellent although somewhat limited in scope.

The disk does not have an instructional component and, as such, it would not generally fall within our search area and as a result it would not normally be considered. However, the disk is part of a series which is instructional and is also quite good; therefore, the demonstration disk has also been evaluated.

STATUS

"Wave Demonstrations" has been designated as a **SUPPLEMENTARY** learning resource for Physics 20.

PURCHASE INFORMATION

This disk is part of a series and may be purchased for $32.00 (1985) from Merlan Scientific Ltd. at the address given at the beginning of the report. The entire series may be purchased for $150.00 It consists of 6 modules: "Periodic Motion"; "Waves in a Linear Medium - Introduction"; "Waves in a Linear Medium - Superposition"; "Periodic Waves - Basic Concepts"; "Longitudinal Wave Demonstrator"; and "Wave Demonstrations". All of these have been authorized as Supplementary resources and reports on them are contained in this document.

Defective diskettes will be replaced without charge within a one year warranty period. Disks which become inoperable through normal use may be replaced for $15.00.

This disk has the advantage of being capable of operation with more than one machine at a time for any particular demonstration; however, such use is subject to copyright laws and any license or purchase agreement.

WAVES IN A LINEAR MEDIUM: INTRODUCTION

DESCRIPTION

Title: Waves in a Linear Medium: Introduction
Series: Waves and Vibrations
Author: G. MacRae
Publisher: Merlan Scientific
Source: 247 Armstrong Ave., Georgetown, ON L7G 4X6
Subject: Science
Topics: Nature of wave pulses in a medium, changes in size and shape of pulses, speed of pulse, reflection
Components: 1 disk and backup, user's guide (3p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monochrome monitor, stop watch
Other Formats Available (not evaluated): Commodore Pet & 64

Version: 1983
Display Language: English
Cost: $41.00 (1985)
Tel. #: (416) 877 - 0171
Users : Grade 11

OBJECTIVES

The student will be able to:

1. State the meaning of the term 'wave'.
2. Describe behaviour changes of a medium as a wave pulse passes through it.
3. Describe changes in size and shape of a pulse as it travels along an 'ideal' spring.
4. Predict the relative speed of a pulse travelling in a spring under different tension and densities.
5. Describe the reflection occurring when a pulse is reflected in a medium from a fixed end and from a free end.

PEDAGOGICAL CONTENT DESCRIPTION

This module contains 3 lessons on waves which the user selects from a menu. Lessons consist of animated graphic displays, descriptions of the events and questions about the concept. The user is occasionally directed to observe a specific item for which questions are asked. For certain items the user is required to use a stop watch to time an event to the nearest 0.2 secs. Each lesson closes with a review of the major terms and objectives of the lesson.

PEDAGOGICAL CONTENT EVALUATION

Each objective has been carefully sequenced and is adequately demonstrated before questions are presented. The range, sequence and depth are all good.

INSTRUCTIONAL FORMAT DESCRIPTION

Using a tutorial type mode, the user is required to push the space bar to advance frames, enter times for events as obtained from a stop watch, respond by entering words to complete a phrase or select the appropriate letter for a multiple choice question. Questions are presented in a fixed sequence.

Positive feedback consists of the presentation of a variety of expressions. In the event of a timing error, the student is required to repeat the timing. The program will provide the answer after a second error.

INSTRUCTIONAL FORMAT EVALUATION

The amount of student interaction is sufficient and is effective in testing the student's grasp of the items under study.

In general the questioning technique is satisfactory but when the user is required to complete an expression, only the exact phrase expected by the program is accepted. Some questions are based on previous screens which the user can not review. Also the fixed order of the questions limits reusability somewhat.

Quantitative feedback which remains at the end of the last lesson (review) would be advantageous.

TECHNICAL CHARACTERISTICS DESCRIPTION

Animated graphics are used to demonstrate the concepts. A high resolution generated character set is employed to present text.

TECHNICAL CHARACTERISTICS EVALUATION

The technical aspects of the program are very good and the program is easy to operate. One minor flaw in the graphics presentation of the wave pulses is the apparent movement of the dots (coils) in the direction of wave propagation rather than simply oscillating perpendicularly to the direction of wave motion.

SUMMATION

The program is not intended to replace 'hands on' work in the laboratory. However, the lessons are well done and will meet their objectives of providing an introduction to waves in a linear medium.

Strengths of the lessons are:

1. The concepts are well developed and are sequenced in a logical order.
2. The user is required to interact frequently and in different modes.
3. The animated graphics contribute greatly to the clarity of the concept being presented.

Weaknesses are minor only and do not detract from the overall effectiveness of the package.

STATUS

"Waves in a Linear Medium: Introduction" has been designated as a **SUPPLEMENTARY** learning resource for Physics 20.

PURCHASE INFORMATION

This disk is part of a series and may be purchased for $41.00 (1985) from Merlan Scientific Ltd. at the address given at the beginning of the report. The entire series may be purchased for $150.00 It consists of 6 modules: "Periodic Motion"; "Waves in a Linear Medium - Introduction"; "Waves in a Linear Medium - Superposition"; "Periodic Waves - Basic Concepts"; "Longitudinal Wave Demonstrator"; and "Wave Demonstrations". All of these have been authorized as Supplementary resources and reports on them are contained in this document.

Defective diskettes will be replaced without charge within a one year warranty period. Disks which become inoperable through normal use may be replaced for $15.00.

This disk has the advantage of being capable of operation with more than one machine at a time for any particular lesson; however, such use is subject to copyright laws and any license or purchase agreement.

WAVES IN A LINEAR MEDIUM: SUPERPOSITION

DESCRIPTION

Title: Waves in a Linear Medium: Superposition
Series: Waves and Vibrations
Author: G. MacRae
Publisher: Merlan Scientific
Source: 247 Armstrong Ave., Georgetown, ON L7G 4X6
Subject: Science
Topics: Constructive and destructive interference of pulses, superposition principle
Components: 1 disk and backup, user's guide (1p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monochrome monitor, game paddles optional
Other Formats Available (not evaluated): Commodore Pet & 64

Version: 1983
Display Language: English
Cost: $37.00 (1985)
Tel. #: (416) 877 - 0171
Users : Grade 11

OBJECTIVES

The student will be able to:

1. Describe what happens to wave pulses after they interfere.
2. Categorize any resultant interference as constructive or destructive, given a pair of pulses.
3. Describe destructive interference caused by symmetrical pulses and non-symmetrical pulses.
4. Use the principle of superposition to construct the resultant pulse given a pair of overlapping pulses.

PEDAGOGICAL CONTENT DESCRIPTION

This module contains 2 lessons on waves which the user selects from a menu. Lessons consist of the presentation of animated graphic displays of pulses traveling along a spring from opposite ends to form constructive and destructive interference. Both symmetrical and asymmetrical pulses are used. The student must respond to the graphic situations by answering questions on the display, entering values read from a graph or moving a flashing cursor to the desired graph location by the use of game paddles.

PEDAGOGICAL CONTENT EVALUATION

The range, sequence and depth of the topics are appropriate for the target audience. Content is accurate but the use of the term 'identical symmetrical pulses' may cause confusion. Using a very specific case for non-symmetrical pulses may give the student the impression there will always be a stationary midpoint, which is not always the case.

INSTRUCTIONAL FORMAT DESCRIPTION

Using a tutorial type mode, the user is required to push the space bar to advance frames, respond to questions by entering true, false or appropriate phrases. In working with graphs, the user may use game paddles to enter locations on a graph or may enter the necessary numerical values from the keyboard. Questions are presented in a fixed sequence.

Positive feedback consists of the presentation of a variety of expressions. Incorrect answers usually result in the demonstration of the action again and re-presentation of the question. Students who continue to make mistakes are given the correct answer and the reasoning.

INSTRUCTIONAL FORMAT EVALUATION

The amount of student interaction is sufficient and is effective in testing the student's grasp of the items under study.

One minor weakness is that students may make errors continually in order to receive the correct answer. Recycling the student through the material is not practiced.

TECHNICAL CHARACTERISTICS DESCRIPTION

Animated graphics are used to demonstrate the concepts. A high resolution generated character set is employed to present text.

TECHNICAL CHARACTERISTICS EVALUATION

The technical aspects of the program are very good and the program is easy to operate. The animated displays illustrating wave behaviour contribute greatly to the clarity of the concept being presented.

SUMMATION

In general the use of animation to present various concepts about waves and their behaviour is very well done and is a good use of the computer medium. The principle of superposition as presented by the program is very well done. However, the illusion created by apparent movement of particles in the medium in the direction of the wave form does distract from a realistic presentation.

STATUS

"Waves in a Linear Medium: Superposition" has been designated as a **SUPPLEMENTARY** learning resource for Physics 20.

PURCHASE INFORMATION

This disk is part of a series and may be purchased for $37.00 (1985) from Merlan Scientific Ltd. at the address given at the beginning of the report. The entire series may be purchased for $150.00 It consists of 6 modules: "Periodic Motion"; "Waves in a Linear Medium - Introduction"; "Waves in a Linear Medium - Superposition"; "Periodic Waves - Basic Concepts"; "Longitudinal Wave Demonstrator"; and "Wave Demonstrations". All of these have been authorized as Supplementary resources and reports on them are contained in this document.

Defective diskettes will be replaced without charge within a one year warranty period. Disks which become inoperable through normal use may be replaced for $15.00.

This disk has the advantage of being capable of operation with more than one machine at a time for any particular lesson; however, such use is subject to copyright laws and any license or purchase agreement.

WATER POLLUTION

DESCRIPTION

Title: Water Pollution
Author: None cited
Publisher: Educational Materials and Equipment Co.
Source: P.O. Box 17, Pelham, N.Y. 10803
Subject: Science
Topics: Water pollution
Components: 1 disk, backup, student lab booklet (4p.) (25 copies), user's guide (6p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, color monitor
Other Formats Available (not evaluated): TRS-80 Model I/III
Alberta Education Call No.: TD 423 H288 1982
Note: This assessment is based on the 1982 Apple II+ version of the product.

Version: 1982
Display Language: English
Cost: $35.00 U.S. (1985)
Tel. #: (914) 576-1121
Users : Grade 11

OBJECTIVES

This program is designed to help students to:

1. Understand the variables that improve/degrade water quality.
2. Determine the impact of water pollution on aquatic populations.
3. Predict the effects of manipulating one or more variables.
4. Improve data interpretation, problem-solving skills and graphing skills.
5. Evaluate hypotheses in light of experimental results.
6. Design experiments and plan a research project.

PEDAGOGICAL 'CONTENT DESCRIPTION

"Water Pollution" is an interactive computer simulation consisting of three programs:

INTRODUCTION - This tutorial section reviews the basic concepts of water pollution (physical properties of water, factors affecting dissolved oxygen levels, types of water pollution, fish kill, biochemical oxygen demand, primary and secondary treatment of wastes, etc.)

EXPERIMENT MODE - This section allows the student to perform water pollution experiments. The student may alter the physical characteristics of a body of water (size, turbulence, temperature), type of waste (sewage, industrial), dumping rate, treatment type (none, primary, secondary), and the number of days the simulated experiment is to run.

QUIZ - The final section of the disk includes a ten question multiple choice quiz.

The accompanying student booklet poses questions to test knowledge, includes five fixed activities to do in the experiment mode, and suggests two advanced activities for further study.

PEDAGOGICAL CONTENT EVALUATION

The range and sequence of topics is appropriate for high school biology. Program content is accurate; however, depth of coverage is insufficient and often results in over-simplification. (E.g. Water pollution is equated with oxygen depletion and other effects of water pollution are not discussed; anaerobic decomposition is tested but not taught, etc.) Within these limitations, however, this disk does provide a basic introduction to the effects of oxygen concentration in fresh water.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of pressing the arrow keys for page turning or letter entries for responses. Amount and sequence are both program controlled (i.e. a student must work through an entire program or exit--(s)he cannot enter at any specific point); rate is user controlled.

Positive feedback consists of the word "correct" followed by an explanation of why the answer is correct when appropriate. On an incorrect response the user is told to "try again". If the second choice is also incorrect, the correct answer is given and an accompanying explanation is given where appropriate.

INSTRUCTIONAL FORMAT EVALUATION

The tutorial portion of this program consists of reading concepts as they are presented. The strength of this program lies in the experimental mode where, along with the activities suggested in the support materials, the student should gain a good appreciation of the effect of different variables on water's ability to support animal life. The options for experimental results to be shown as a table, graph or print-out provides different perspectives on the results.

The quiz, although restricted to 10 multiple choice questions, covers the concepts of the program (except anaerobic breakdown) as well as allows for a limited application of knowledge gained from the program. The explanation statements which accompany correct answers reinforce student knowledge.

TECHNICAL CHARACTERISTICS DESCRIPTION

This program effectively uses both color and graphics. Sound is used to show oxygen consumption (by Pac-man).

TECHNICAL CHARACTERISTICS EVALUATION

Technical design is generally effective although the large lettering used in the displays combined with the overuse of displays may be more appropriate for an elementary audience. Slow graphic production tends to detract from the information that is presented.

SUMMATION

Although the tutorial section of this disk is primarily a page turner and the quiz is limited to only ten questions, the experimental mode allows an interesting test of the effects of different variables on a water's ability to support fish life.

STATUS

"Water Pollution" has been designated as a **SUPPLEMENTARY** learning resource for Biology 20.

PURCHASE INFORMATION

This product may be purchased for $35.00 U.S. (1985) from Educational Materials & Equipment Company at the address given at the beginning of the report. Any non-functioning disk will be replaced at no charge as long as the publisher is assured that the disk rather than the hardware is the source of the problem. This warranty applies as long as the program is published.

As disk interaction is frequent, use of the product is limited to one machine at a time.

THE WHATSIT CORPORATION

DESCRIPTION

Title: The Whatsit Corporation
Author(s): Waterford School District
Publisher: Sunburst Communications
Source: 39 Washington Avenue, Pleasantville, NY 10570
Subject: Mathematics, Business Education
Components: 1 disk & backup, teacher's guide (54p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monochrome monitor
Other Formats Available (not evaluated): Commodore 64, TRS-80 Model III

Version: 1983
Display Language: English
Cost: $59.00 U.S. (1985)
Tel. #: (914) 769-5030
Users: Grades 10 - 12

OBJECTIVES

This package is designed to:

1. Provide practice in calculating, estimating, record keeping, working with equations and multiple variables, and reading graphs.
2. Teach students to use mathematics as an analytical tool in making decisions and finding solutions.
3. Provide simulated experience in managing a business.
4. Develop problem-solving skills such as planning ahead, working in two time frames, and evaluating and modifying a strategy.

CONTENT DESCRIPTION

This program is a simulation in which a student runs a small, one product business for up to six months. The user may conduct market surveys, buy a franchise, hire outside consultants, take out a loan, etc. Weekly and monthly decisions involve hiring and laying off people, ordering inventory, setting prices, paying off loans, hiring accountants, and buying advertising services. A monthly statement of income and expenses provides students with information on which to base their next month's decisions.

CONTENT EVALUATION

Students must have classroom instruction in business and marketing terminology prior to using this program. Although the target audience is specified as grade six to adult, the range would be most appropriate to upper junior high students or possibly as a review of basic math skills at the high school level. The option of repeating the simulation as often as desired provides ample depth.

Used in a math classroom, this program offers an interesting approach to basic calculations (addition, subtraction, multiplication, division) and some formula applications (e.g. interest calculations).

This program could also be used in a business education classroom to provide a very basic introduction to marketing/business strategies; however, caution must be exercised to assure that students understand that it is a bare-bones simplified model that is being portrayed and that running an actual business involves a host of factors not even alluded to in this simulation (e.g. overhead expenses, taxes, insurance costs, marketing and distribution costs, etc.). While the program should provide students with an understanding of the need for careful planning, decision making and record keeping in order to make a profit, the options of bankruptcy or receivership should a business be unsuccessful are not discussed. Furthermore the limitation to selling just one item may be unrealistic and the practice of allowing repeated rush orders of 40 items of inventory may inculcate poor business habits.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of making choices from weekly and monthly decision menus and entering the requested numerical data. Feedback consists of a double check on the accuracy of student input, reminders of decision already made or to be made before a new decision can be implemented, quantitative monthly reports (income statements) and weekly qualitative reports (e.g. "We ran out of whatsits"). There is no formal evaluation of student success--students are left to analyse their productivity based upon the results of the monthly statement provided.

Rate is user controlled; sequence and amount are program controlled.

INSTRUCTIONAL FORMAT EVALUATION

The amount and type of student interaction is appropriate for the target audience; however, the level of abstraction combined with the attention span required for the six month run may be beyond the range of the younger students. (This is partially alleviated, however, by the ability to save an "in progress" simulation for resumption at a future time). The simulation utilizes an effective method of inquiry causing students to apply high level thinking skills. While feedback is very limited, the cueing prompts are effective in aiding students in decision making. Weaker students lacking skills in self-evaluation may need teacher assistance in analyzing their performance.

The simulation lends itself to either an individual or team approach.

TECHNICAL DESIGN DESCRIPTION

Displays are totally textual in nature and utilize combination upper/lower case standard size lettering. Color in the form of underlining is used for emphasis. A series of clicks draws attention to economic forecasts and beeps are used to denote entry errors.

TECHNICAL DESIGN EVALUATION

Character size is appropriate, screen displays are clear and transition is smooth. Unfortunately the program does not allow a review of previous decisions and their financial outcomes. It would be most appropriate to utilize graphs and charts to provide this information to aid in wise decision making. The minimal use of color and lack of graphics make the program appear dull to younger users. The ability to save data to permit continuation at a future date is a program strength.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

The sixty page teacher's guide provides instructions, activity master sheets, and transparency masters which are essential for use prior to program operation. The program will store up to 40 sets of student data.

MANAGEMENT SYSTEM EVALUATION

The teacher's guide and the user pre-activity materials provide excellent and essential program support. The ability to store data for future resumption is advantageous, however it would be useful if the teacher could actually view the results of a student's decisions in order to assist him/her in making a self-analysis of progress. (At present, the teacher can delete files but cannot view them).

SUMMARY STATEMENT

Provided students have been thoroughly versed in business terminology via classroom instruction and the use of the user activity sheets, this simulation provides an interesting application of basic math concepts and business decision making skills.

STATUS

"The Whatsit Corporation" has been authorized as a **SUPPLEMENTARY** learning resource for Math 15/25 and Basic Business 20/30.

PURCHASE INFORMATION

This product may be purchased for $59.00 U.S. (1985) from Sunburst Communications at the address given at the beginning of the report. A lab pack, consisting of 10 diskettes and one set of teacher documentation is available for $177. U.S. (1985). Sunburst Communications offers a lifetime warranty on their courseware products and will replace defective diskettes at no charge.

Due to disk interaction in recording scores, the disk should be used with only one computer at a time.

WORD SPINNER

DESCRIPTION

Title: Word Spinner
Author(s): Dale Disharoon
Publisher: The Learning Company
Source: 545 Middlefield Road, Menlo Park, CA 94025
Subjects: Language Arts
Topics: Reading, vocabulary and spelling by completing the word
Components: 1 disk, teacher's guide (31p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, colour monitor preferred, joystick (optional)
IBM PC, 64K, colour monitor preferred, joystick (optional)
Other Formats Available (not evaluated): Commodore 64, Atari

Version: 1984
Display Language: English
Cost: $34.95 U.S. (1985)
Tel. #: (415) 328-5410
Users: Grades 2 - 6

OBJECTIVES

"Word Spinner" is designed to give children an opportunity to explore letter patterns, recognize words, experiment with similar-looking words, identify correct spellings and develop word game strategies.

PEDAGOGICAL CONTENT DESCRIPTION

This program is a word-building game in which three or four letter words are constructed. The student attempts to complete a word by choosing letters which will complete the blank spaces. The correct words are entered into the word wheel and once the student accumulates three hundred points, (s)he spins the word wheel for a prize. The user has several options which include length of the unknown word (3 or 4 letters), location of the blanks (one blank for three letter words and 2 blanks for four letter words), sound off/on and timer off/on. A help menu is available which outlines basic control features, the goal of the game, how to play it, and an explanation of how points are won or lost. Five hundred three-letter words and one thousand four-letter words are available.

PEDAGOGICAL CONTENT EVALUATION

The range of content is appropriate for most of the target audience but younger students may need some initial teacher assistance. There is no sequence in the presentation but the teacher may pick the pattern to be practiced at the beginning of play. Although content appears to be accurate, it was noted that occasionally a valid word combination was not accepted. It would be helpful to have all the words used in the games listed in the teacher's guide. The program provides ample practice, however, some of the vocabulary used in certain word patterns may be somewhat difficult for the younger target audience.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of menu selections, manipulating arrow keys, special control keys or a joystick, using spacebar to choose letters or spin the wheel. Students input responses by cycling through the alphabet by using arrow or designated alphabet keys. Completed words are entered by pressing the space bar. Students can access the help menu by pressing "?", return to the menu by pressing ESC and return to the game by using RETURN. Words containing blanks are presented in predetermined letter pattern and may be changed at the end of each game, if desired. The letters presented are in random order within the pattern selected.

A correct word response results in a cheery beep, the word is transferred to the word wheel and points are awarded on the screen. If three hundred points are accumulated before the time expires, the words "You did it!" flash on the screen and the player is asked to spin for a prize. Then a picture of the prize is displayed on the top of the screen. Prizes are accumulated as play continues. The words made by the player may be printed if desired. An incorrect response results in arrows pointing to the error, a short beep and a loss of points.

No testing or branching is provided in this program.

INSTRUCTIONAL FORMAT EVALUATION

The student interaction is appropriate for most of the target audience and the game requires alert and active participation from the students. The timing concept will likely motivate older students but may be inappropriate for others; however, this is an option which can be controlled by the teacher. The "cycling" through the alphabet is useful in that it allows the student to see each letter placed in the blank to determine if it forms a proper word.

The feedback is generally appropriate and adds to the program without being overpowering or threatening. The fact that sound is an option is a good feature, especially for classroom use. Unfortunately, no quantitative feedback is available to the teacher regarding error patterns or number of attempts etc.

The control features are generally easy to use and may be readily adjusted. The teacher will likely want to set the word size, timing and sound features for the youngest users.

TECHNICAL CHARACTERISTICS DESCRIPTION

Text is presented using upper and lower case letters that are larger than normal. Colour, graphics and sound are used in this program. Sound is an option.

TECHNICAL CHARACTERISTICS EVALUATION

Character size, font and case are used appropriately. Displays are generally clear and readable; however, the help screen tends to be somewhat crowded. Sound and the timer can be suitably controlled. The graphics enhance the program by making it more interesting. Although a colour monitor is preferred, this program can also be used effectively with a monochrome monitor. Most students should be able to use this program independently after a short guided introduction by the teacher.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

Basic pre-reading skills and some decoding skills will be required in order to use the program. No management system is provided in this program.

The teacher documentation consists of information on menu choices; instructions on how to play the game; instructions on playing against the timer, winning and losing points, spinning for prizes and printing words; information on the skills and concepts covered; and a listing of the letter patterns used in the program. There are also suggestions for additional activities and recordkeeping. No other user support materials are provided.

IMPLEMENTATIONAL SUPPORT EVALUATION

The absence of a management system increases the need for teacher to monitor student progress. The documentation is clearly laid out and easy to follow; however, it may be useful to have pages nine and ten of the guide precede page six in order to provide sufficient information before attempting the program. The inclusion of the patterns used in the games will help the teacher to integrate this program with the language arts program. The suggested activities, though limited, are useful.

Most students should be able to use the program independently after a suitable introduction by the teacher. The teacher will find the program very easy to use.

SUMMATION

The game format provides practice in word building skills in a "fun" setting which is motivating and appropriate for most of the target audience. The colour, graphics and sound will appeal to young children and the program is easy to use. Some weaknesses noted in the program are that no systematic explanation of word patterns is provided and the cumulative scores don't indicate how many tries were required or what type of errors were made.

APPLE - IBM VERSIONS

This report is based on the evaluation of the Apple product. In reviewing the IBM version, it was found that it did not differ in any substantial fashion from the Apple product.

STATUS

The Apple and IBM versions of "Word Spinner" have been authorized as **SUPPLEMENTARY** learning resources for grades 2 - 6.

PURCHASE INFORMATION

This product may be purchased for $34.95 U.S. (1986) from The Learning Company at the address given at the beginning of the report. A back up diskette may be purchased for $15 U.S. A lab pack, consisting of 5 copies of the software, is also available for $63.

Defective diskettes will be replaced without charge within a 90 day warranty period. Thereafter, disks which are damaged by the user will be replaced for $10 upon return of the diskette. This included disks which wear out through normal usage. There is no time limit for this warranty.

This disk has the advantage of being capable of operation on more than one machine; however, such use is subject to copyright laws and any license or purchase agreement.

WRITING ACTIVITIES

DESCRIPTION

Title: Writing Activities and Language Skill Builders
Series: Activity Files for the Bank Street Writer — **Version:** 1984
Author(s): Stephen Marcus et al — **Display Language:** English
Publisher: Scholastic Inc. — **Cost:** $85.00 (1986)
Source: 123 Newkirk Road, Richmond Hill, Ontario L4C 3G5 — **Tel. #:** (416) 883-5300
Subject: Language Arts — **Users:** Grades 5 - 9
Topics: Generating ideas for writing, overcoming writing block, revising work, language skill builders
Components: 1 disk and 2 backups, teacher's guide (128p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monochrome monitor, printer, Bank Street Writer Program disk
IBM PC, 64K, monitor
Other Formats Available (not evaluated): Commodore 64, Atari

OBJECTIVES

This program is designed to help students become more skilled users of the "Bank Street Writer" and to help students improve their composition skills and attitudes towards writing.

PEDAGOGICAL CONTENT DESCRIPTION

This program consists of a data disk containing thirty-five files that provide twenty-two different activities for use with "Bank Street Writer". The activity files focus on word processing skills and writing as an "enjoyable" process with the student's writing being considered as early drafts for future work. The word processing skills include: cursor movement for text insertion and scrolling; deletion and text movements; search and replace; using passwords; and, storing, altering, retrieving and printing text files or partial files. The range of composition skills involves evaluating writing for interest; pre-writing techniques such as invisible writing and freewriting; peer editing; point of view; and, creative writing of stories, poetry, essays, narratives, expository articles, editorials, character sketches and historical sketches. Groups of files dealing with the same activity should be followed in sequential order; however, each activity may be accessed in any order. Each file provides an explanation of the activity and the user is given either examples of the activity or is walked through the process. Suggestions for using and extending word processing and composition skills are provided. All files but one contain both word processing and composition activities.

PEDAGOGICAL CONTENT EVALUATION

The range of content is appropriate for the target audience; however, some students may find files such as the Ripper Files or the Sher 3 File too challenging. The activities presented are varied, interesting and motivational. Students are encouraged to develop writing skills in a variety of ways and to become more proficient in using the capabilities of the word processor. The extension of these skills to other subject areas is encouraged. The program provides some excellent ideas for writing but it should be considered as a supplement to teacher development of the writing process over a period of time. It is also noted that the extent to which a teacher wishes to use the program to practice and develop word processing and composition skills is affected by the limitations inherent in "The Bank Street Writer". The wide variety of activities and the suggestions for extending these activities provide sufficient practice exercises; however, more attention could be given to the use of the editing capabilities of the word processor in proofreading documents and making required changes in grammar, punctuation, etc. Generally there is no ordered sequence except within groups of files dealing with the same activities.

The content is intended for an American audience. Although the teacher will have to deal with this in some files, the skills presented and the range of content appear appropriate to the Alberta curriculum.

INSTRUCTIONAL FORMAT DESCRIPTION

Student interaction consists of scrolling screens of information by using the appropriate word processing commands, accessing Bank Street writer commands to complete tasks, and using the word processor to enter and edit text. The activities and questions are presented in a preprogrammed order using a variety of formats in the word processor files. No feedback other than quantitative feedback in a point score format in one file is provided to the student. The program has no built-in evaluative system.

INSTRUCTIONAL FORMAT EVALUATION

Student interaction is consistent and promotes learning through an inquiry approach which involves participation in manipulating the functions of the "The Bank Street Writer" and experimenting with creative writing techniques. However, in some files, the entry of text is somewhat confusing since clear directions for beginning to write or to start a new file are not given. Although the usual type of feedback is not provided, it is not required in this type of program. The user's own sense of accomplishment and publication are the rewards. The program's format allows a great deal of flexibility to both the teacher and the student in its use.

TECHNICAL CHARACTERISTICS DESCRIPTION

All files are created with "The Bank Street Writer" and are displayed in the word processor's format. Text is displayed in standard size using upper and lower case letters. The program does not use color, graphics nor sound.

TECHNICAL CHARACTERISTICS EVALUATION

The technical quality is satisfactory; however, the paging commands tend to get "out of sync" fairly easily in the text pages. To correct this, it is usually necessary to return to the beginning of the file and start over. This feature can be irritating and it detracts from student motivation. It is noted that in some files students may have difficulty knowing where they are expected to input information. Clear directions would be helpful.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

This program assumes that the users are familiar with the basic Bank Street Writer commands and have used the word processor before. No management system is provided in this program.

The teacher documentation includes a general introduction to the program, short summaries of the Activity Files, instructional objectives and suggested classroom uses for each file and the text of files itself. No other user support materials are provided.

IMPLEMENTATIONAL SUPPORT EVALUATION

The lack of a management system is not a disadvantage due to the nature of the program; however, the inclusion of a system to keep track of completed activities and the time spent on each would be helpful to the teacher. It is noted that each student will require his/her own data disk to store completed work. The teacher documentation is comprehensive and easy to use. The inclusion of the text of the Activity Files is helpful and the suggestions for classroom use offer some very good activities.

This program is easy to implement for teachers with a good working knowledge of the "The Bank Street Writer". The files are adaptable to a variety of classroom activities and can be used with individuals, pairs, or groups. Students may need some assistance from the teacher initially but should require minimal supervision after that.

SUMMATION

This program offers motivational and challenging activities to develop word processing and composition skills. The approach to writing as a process and the emphasis on creative thinking are attractive features of the program. The program is easy to implement and use in a variety of classroom settings but its use is limited to the capabilities of the Bank Street Writer.

The American bias, the scrolling process of files, and the lack of a management system are disadvantages but should not preclude the use of this program. The inclusion of files that present and review elements of composition and editing would be beneficial.

APPLE - IBM VERSIONS

This report has been based on an evaluation of the Apple version. A review of the IBM version revealed that the catalog of activities contained on the disk was listed in alphabetical order rather than in progressive order of difficulty, however there were no significant differences in content.

STATUS

The Apple and IBM versions of "Writing Activities and Language Skill Builders" have been authorized as **SUPPLEMENTARY** learning resources for grades 5 - 9.

PURCHASE INFORMATION

This product may be purchased for $85 (1986) from Scholastic Inc. at the address given at the beginning of the report. A lab pack, consisting of five program disks and a user's handbook, is available for $125 (1986). Individual disks may be purchased for $32.

Defective diskettes will be replaced without charge within a 60 day warranty period. For one year thereafter, defective or damaged disks may be replaced for $10.

This disk has the advantage of being capable of operation on more than one machine at a time provided that only one file is accessed; however, such use is subject to copyright laws and any license/purchase agreement.

WRITING CHEMICAL FORMULAS

DESCRIPTION

Title: Writing Chemical Formulas
Author: Don Ross
Publisher: Microcomputer Workshops
Source: c/o CBS Interactive Learning, One Fawcett Place, Greenwich, CT 06836
Subject: Science
Topics: Chemical formulae
Components: 1 diskette, backup, guide (4p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monochrome monitor
Other Formats Available (not evaluated): Available in Apple format only
Alberta Education Call No.: QD 7 W956 1983

Version: 1983
Display Language: English
Cost: $29.95 U.S. (1985)
Tel. #: (203) 622-2500
Users : Grade 10

OBJECTIVES

To give a student practice in writing chemical formulas from a possible base of more than 120 different compounds that are randomly chosen.

PEDAGOGICAL CONTENT DESCRIPTION

The program covers the writing of chemical formulae for ionic substances given the name of the substance. Eleven metals, seven simple nonmetals and four complex ions are used to generate problems. Multi-valence metals and hydrates aren't included. The user may access a remedial branch which develops the formula for each problem or a help page which lists the ions used in the program along with their oxidation numbers. After each problem, the user is informed about the number of errors made and is given the option of trying another problem. When the user elects to exit, the total number of errors and average number of errors per trial is shown.

PEDAGOGICAL CONTENT EVALUATION

The depth of the treatment, considering the material covered, is appropriate for the upper end of the target audience but requires some prerequisite knowledge about the nature of ions, oxidation numbers and the use of brackets with complex ions.

The range of the program is insufficient to cover the stated objective. The lack of coverage of multi-valenced metals, hydrates, acid names and a variety of molecular compounds makes the program more appropriate to a junior science course. At this level, the 'senior high depth' may be a disadvantage.

The content is quite accurate with the exception of the guidebook referring to ions and complex ions as elements and gold being shown with a +1 charge on the oxidation table.

INSTRUCTIONAL FORMAT DESCRIPTION

User interaction consists of the entry of numerical (oxidation numbers, charge balancing) and alphabetic (ion symbols, compound formulas) responses to questions as well as the pressing of the return key for page turning. The ESCAPE key is used to enter lower case letters for the chemical symbols. The user has an optional instructional branch (8 pages) at the beginning of the program and remedial branches (approximately 10 pages) for each problem. The user chooses whether or not (s)he will do another problem at the end of each question.

The problems are chosen randomly from a limited data bank of 11 metals, 7 simple non-metals and 4 complex ions. The remedial branch poses questions in a programmed order to elicit the correct formula for the compound being considered.

Positive feedback consists of a standard response followed by one of ten randomly chosen statements. Negative feedback asks the student if (s)he needs help which, if answered affirmatively, enters the user into the remedial branch. Positive feedback within that branch consists of short positive statements while negative feedback provides the correct formula. In either case, a summary table of information building towards the correct formula is filled in. At the end of the branch, the total number of errors made is given along with a positively stated evaluation. If the user elects not to do the remedial branch after getting a question wrong, the original question is repeated. Errors result in a second offer to present the remedial branch. Quantitative feedback at the end of the program describes the number of problems tried, the total number of errors and the average number of errors per problem.

INSTRUCTIONAL FORMAT EVALUATION

The program has an effective drill and practice format. The remedial branch, the procedure of maintaining the "help" information on the screen for all problems, the evaluation of answers with the answer being maintained on the screen, the encouraging feedback and the repetition of questions which were answered incorrectly are all strong positive features.

The program has some weaknesses however. Questions are not effectively randomized and the same question may appear twice in a row even if it was answered correctly. The remedial branch cannot be exited quickly once the answer is realized and a new question cannot be obtained until the present one is answered.

TECHNICAL CHARACTERISTICS DESCRIPTION

There is no use of color or sound in the program. Graphics are used for the numerical subscripts, lower case letters and for the remedial chart lines.

TECHNICAL CHARACTERISTICS EVALUATION

The displays are well spaced and appropriate. Upper and lower case letters along with subscript numbers (automatically subscripted) accurately simulate chemical formulas. The remedial branch display is always on the screen so that users will be reminded of the steps involved in finding the formula. The chemical symbols and oxidation numbers are available at all appropriate times. Finally, the program is simple and easy to use.

Negatively, the program allows letter and numerical input where only one or the other is appropriate. The keys are not frozen for inappropriate inputs and the program will bomb through CTRL-C or CTRL-RESET. Chemically, + and - are allowable simplifications whereas the program insists upon +1 and -1 for oxidation values. Sometimes the program can be frustrating due to the slow development of the remedial branch. Grade ten students, while they found the program very easy to do, also found it to be non-motivational.

SUMMATION

The major strengths of the program include accurate chemical notation, immediate feedback to all responses and the availability of a help screen and a remedial branch. The remedial chart is always on the screen to remind the user of the steps in finding the correct chemical formula.

The program has content weaknesses in that multivalent ions, many complex ions, hydrated compounds, acids and molecular substances are not attempted in the program. This makes it too limited to be of great value to senior high courses. Also, users who refuse to take the rather long remedial branch cannot proceed to another problem and no diagnosis of errors is provided.

STATUS

"Writing Chemical Formulas" has been designated as a **SUPPLEMENTARY** learning resource for Grade 10.

PURCHASE INFORMATION

This product may be purchased for $29.95 U.S. (1985) from CBS Interactive Learning at the address given at the beginning of the report. Lab packs are available in the following quantities and prices: 10 copies @ 3 x list price; 15 copies @ 4 x list price; 20 copies @ 5 x list price; 25 copies @ 6 x list price. The company provides a life time guarantee against defective diskettes and will replace worn out diskettes without charge at any time.

Due to frequent disk interaction, this disk may be used with only one machine at a time.

WRITING SKILLS BANK

DESCRIPTION

Title: Writing Skills Bank
Series: Activity Files for the Bank Street Writer
Author(s): Deborah Kovacs et al
Publisher: Scholastic Inc
Source: 123 Newkirk Road, Richmond Hill, ON L4C 3G5
Subjects: Language Arts
Topics: Activities for teaching specific writing objectives, fundamentals of the writing process
Components: 1 disk and 2 backups, teacher's guide (96p.)
System Requirements: Apple II+/IIe/IIc, 48K, 1 disk drive, monitor, printer, "Bank Street Writer" program disk
IBM PC, 64K, monitor
Other Formats Available (not evaluated): Commodore 64, Atari

Version: 1984
Display Language: English
Cost: $85.00 (1986)
Tel. #: (416) 883-5300
Users: Grades 7 - 9

OBJECTIVES

This program is designed to provide practice and thus improve a student's skill in various forms of written expression including narration, explanation, character studies, and letters.

PEDAGOGICAL CONTENT DESCRIPTION

The disk "Writing Skills Bank" included in this package is dual sided. Side one, entitled "Lessons", contains a series of forty prepared writing activity lessons that relate to specific writing skills. Each lesson begins with a core writing activity and then uses that activity as a foundation for an additional three to five exercises designed to provide practice in editing, proofreading and writing. All lessons are arranged in order of difficulty and correlate with the text provided in the teacher's manual.

Side two of the disk contains an additional bank of 164 independent writing lessons. These are indexed by objectives, thus teachers can draw from them to create a custom-designed set of activities to supplement areas in which students may be experiencing difficulty (e.g. punctuation, letter writing, transcribing oral messages, writing descriptions, making revisions, etc.).

PEDAGOGICAL CONTENT EVALUATION

This program carefully identifies the objectives of written communication and then provides practice exercises to develop and reinforce skill in each area. Content is well sequenced. Range is appropriate for the target audience, although students may find some of the advanced lessons are too long to complete in one class period and thus may need to save their work for continuation the next day. Ample depth is available, especially since teachers have the option of supplementing side one activities with custom built exercises designed to reinforce areas of perceived need.

American bias is evident in the addresses used on letters, however this is not a major problem, particularly since addresses can be edited via the Bank Street Writer word processor.

INSTRUCTIONAL FORMAT DESCRIPTION

Students must have familiarity with "Bank Street Writer" prior to using this program. Students load "Bank Street Writer", load a particular lesson from "Writing Skills Bank", enter their name and the date, proceed through the exercises for a given objective in order, and then save their work to either an individual disk or a class disk. Program sequence could either be chosen by the student or assigned by the teacher.

INSTRUCTIONAL FORMAT EVALUATION

This program does not offer instruction per se, however the exercises correlating with each objective should result in direct improvement in writing skill. A strength of the program is the way it allows the student to manipulate, add, delete, and correct words without difficulty. Feedback and remediation become the sole responsibility of the teacher. While the open-ended nature of the program by necessity limits the amount of feedback the program could generate, it is unfortunate that, in at least some of the exercises the computer's ability to provide instant feedback is not harnessed.

The program assumes students have total familiarity with the operation of the "Bank Street Writer" word processor--teachers may need to give assistance to students with weak skills in this area.

TECHNICAL CHARACTERISTICS DESCRIPTION

Text is displayed in either 40 column or 80 column mode, depending upon whether the program is used in conjunction with the initial edition of "Bank Street Writer" or the enhanced version. Color and graphics are not part of the program. Sound is used to draw attention to errors.

TECHNICAL CHARACTERISTICS EVALUATION

The use of combination upper/lower case print is appropriate for the target audience. Displays are clear and are appropriately designed.

Evaluators found that when the program was used with the enhanced version of "Bank Street Writer", arrow keys depicted every carriage return, resulting in a cluttered screen appearance. These arrows did not appear when the older version of "Bank Street Writer" was used.

IMPLEMENTATIONAL SUPPORT DESCRIPTION

The teacher's manual which accompanies this program is divided into three sections: the introduction provides an overview of the program and background information on its development; the second section explains the structured lessons portion of the disk and outlines the topics and activities for each lesson; and the third section explains how the additional activities contained on side two of the disk can be incorporated into teacher designed lessons for additional drill and remediation.

IMPLEMENTATIONAL SUPPORT EVALUATION

The teacher's manual present concise yet thorough information for program use. Teachers are reminded that students must be thoroughly familiar with using "Bank Street Writer" as a word processor before they should attempt this program.

SUMMATION

This program presents interesting lessons in an easy to use manner and would definitely assist in building the writing skills of grades 4, 5 and 6 students. The option of custom designing exercises using the additional activities provided on side two of the disk is an excellent feature. The only drawback to the program is that feedback becomes the sole task of the teacher.

APPLE - IBM VERSIONS

This report has been based on a evaluation of the Apple version; however a review of the IBM version revealed no significant differences other than for differing machine operation descriptions in the teacher's manual.

STATUS

The Apple and IBM versions of "Writing Skills Bank" have been authorized as **SUPPLEMENTARY** learning resources for grades 7 - 9.

PURCHASE INFORMATION

This product may be purchased for $85 (1986) from Scholastic Inc. at the address given at the beginning of the report. A lab pack, consisting of five program disks and a user's handbook, is available for $125 (1986). Individual disks may be purchased for $32.

Defective diskettes will be replaced without charge within a 60 day warranty period. For one year thereafter, defective or damaged disks may be replaced for $10.

This disk has the advantage of being capable of operation on more than one machine at a time provided that only one file is accessed; however, such use is subject to copyright laws and any license/purchase agreement.